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ECONOMIC FEASIBILITY OF A LARGE ARENA
OR TWO ARENA COMPLEX
FOR THE BOSTON AREA
REPORT B

ECONOMIC FEASIBILITY OF A LARGE ARENA
OR TWO ARENA COMPLEX
FOR THE BOSTON AREA

REPORT B

Prepared For:

The Boston Arena Authority

By

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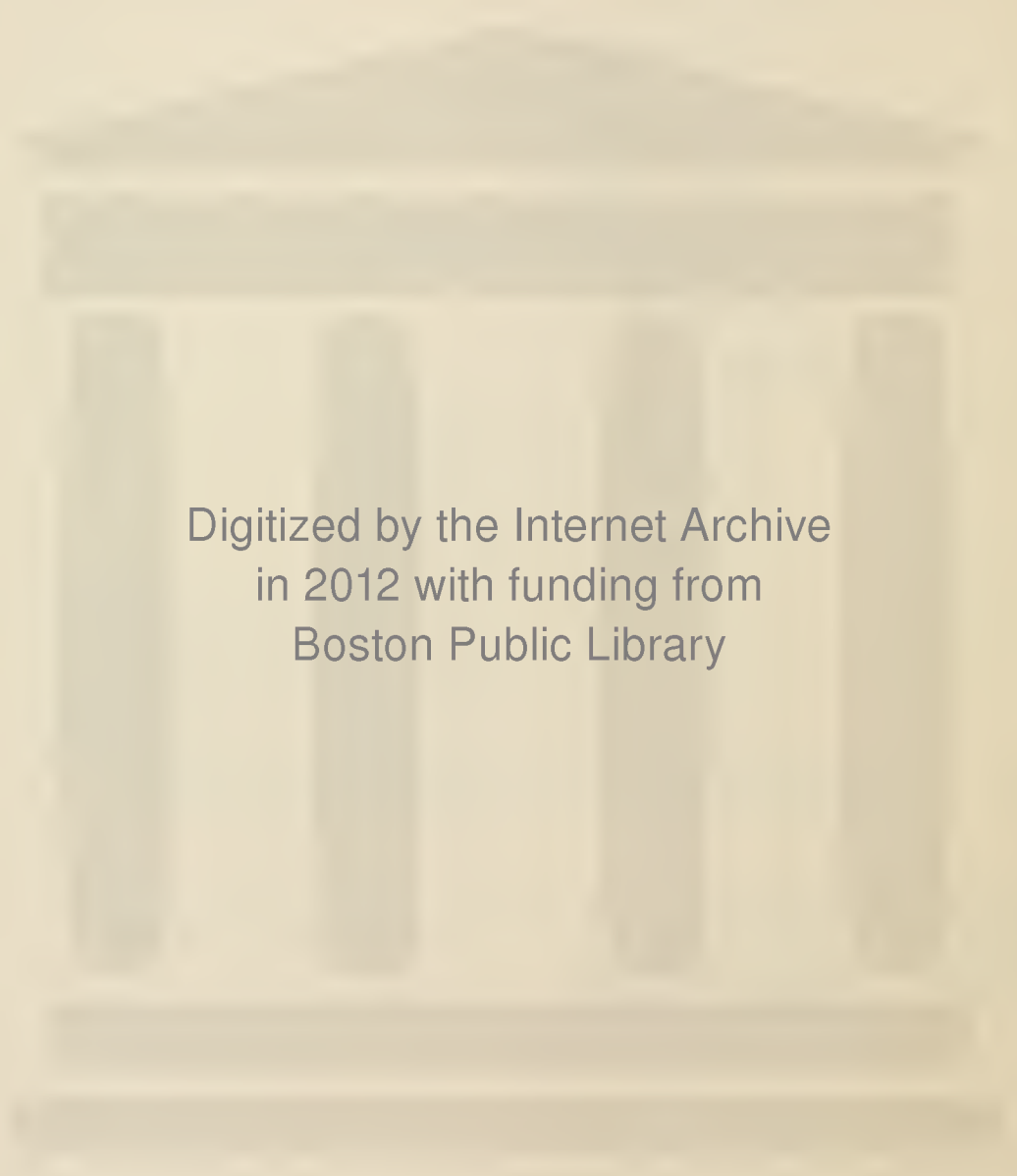
January 1972

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TABLE OF CONTENTS (Continued)

<u>Chapter</u>		<u>Page</u>
	Site Analysis	64
	South Station	65
	North Station	68
	Kendall Square	72
	Existing Boston Arena Site	75
	Time Schedules	76
	Estimates	78
	Large Arena - South Station	79
	Large Arena - North Station	80
	Large Arena - Kendall Square	81
	Large and Small Arenas Combined - South Station	82
	Large and Small Arenas Combined - North Station	83
	Large and Small Arenas Combined - Kendall Square	84
VII	SITE CONSIDERATIONS AND INVESTMENT IMPLICATIONS	85
APPENDIX A	CONVENTION IMPACT OF A NEW LARGE ARENA IN BOSTON	94
APPENDIX B	ARENA USE FACTORS	97



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LIST OF EXHIBITS

<u>Exhibit</u>		<u>Page</u>
II-1	Summary of Net Unsupported Debt for Various Arena Options	6
III-1	Population Characteristics of Cities Having Major League Basketball and/or Hockey	11
III-2	Family Income in Cities with Major League Basketball and/or Hockey	12
III-3	Employment Profile, City of Boston and Boston Metropolitan Area	13
III-4	Sports Receipts Levels for Selected Metropolitan Areas, 1967	14
III-5	Consumer Demand and Expenditures for Sports Events	15
III-6	Major League Baseball Attendance, 1966-1970	16
III-7	National Football League Attendance, 1966-1970	17
III-8	National Basketball Association 1970-71 Attendance Breakdown	19
III-9	National Hockey League 1970-71 Attendance Breakdown	20
III-10	U.S. Expenditure for Admission to Spectator Sports	21
III-11	National Basketball Association Attendance	22
III-12	American Basketball Association Attendance	23
III-13	National Hockey League Attendance	24
IV-1	Event Schedule at Boston Garden, September 1971 through May 1972	33
IV-2	Event Schedule at Boston Arena, 1970-71	34
IV-3	John B. Hynes Civic Auditorium 1972 Event Schedule	35
IV-4	Existing Large Indoor Mass Spectator Facilities in the Boston Area	36
IV-5	Representative Schedules at Arenas in Other Cities	37
IV-6	Analysis of Event Day Supply and Demand in the Boston Area for Arena-Type Events	38

LIST OF EXHIBITS (Continued)

<u>Exhibit</u>		<u>Page</u>
IV-7	Size Distribution of a Sample of Large National Conventions	39
IV-8	Size Distribution of Conventions and Exhibits Held in Boston During 1971 by Type of Facility	40
IV-9	Pro-forma Event Schedule - Typical Arena	41
IV-10	Alternative Event Day Schedules Assuming New Facility Consists of One Large Arena	42
IV-11	Alternative Event Day Schedules Assuming New Facility Consists of Two Arena Complex and Boston Garden Continues to Operate	43
IV-12	Alternative Event Day Schedules Assuming New Facility Consists of Two Arena Complex and Boston Garden Not in Operation	44
V-1	Per Capita Income to Arena by Type of Event	50
V-2	Attendance and Revenue Projections by Type of Event	51
V-3	Operating Revenues	52
V-4	Non-Reimbursed Annual Operating Expense Projections	53
V-5	Debt Service Capacity from Arena Operating Surplus	54
VI-1	Type of Arrival Tabulation	57
VI-2	Site Configuration - Large Arena - South Station	66
VI-3	Site Configuration - Two Arena Complex - South Station	67
VI-4	Site Configuration - Large Arena - North Station	69
VI-5	Site Configuration - Two Arena Complex - North Station	70
VI-6	Site Configuration - Large Arena - Kendall Square	73
VI-7	Site Configuration - Two Arena Complex - Kendall Square	74

LIST OF EXHIBITS (Continued)

<u>Exhibit</u>		<u>Page</u>
VII-1	Construction Cost Estimates for Alternative Locations and Facility Options	88
VII-2	Potential Extra Capital Contribution for Providing a Schoolboy Track Facility	89
VII-3	Net Effects of Expanded Schedules Related to Competitive Policy of Boston Garden	90
VII-4	Parking Revenue at Various Site Options	91
VII-5	Net Unsupported Debt Under Alternative Conditions of Location and Operation for a Large Arena	92
VII-6	Net Unsupported Debt Under Alternative Conditions of Location and Operation for a Two Arena Complex	93
B-1	Attendance Distribution, National Basketball Association Home Games, 1970-1971	99
B-2	Attendance Distribution, National Hockey League Home Games, 1970-1971	100
B-3	Attendance Distribution, American Basketball Association Home Games, 1970-1971	101
B-4	Expected Pattern of Attendance/Game at an Annual Attendance Level of 450,000 for Basketball or Hockey	102
B-5	Expected Pattern of Attendance/Game at an Annual Attendance Level of 650,000 for Hockey	103
B-6	Net Revenue Differential per Incremental Unit of Seating Capacity for Basketball	104
B-7	Distance from Arena to Central Business District for Various Cities Which Have Professional Basketball or Hockey Franchises	105
B-8	Distance Travelled to Attend Indoor Sports Event - Oakland Area	106
B-9	Attendance Versus Population Distribution in Driving Intervals to Arena - San Diego Gulls Hockey Games	107
B-10	Average Distance Versus Propensity to Attend Curve for Indoor Sports Events	108

CHAPTER I

INTRODUCTION

For an area of its size and diversity, Boston has limited mass spectator facilities. The Boston Arena and the Boston Garden are both old buildings. Their combined capacity is inadequate to meet all the needs of the area for such facilities. Lack of air conditioning in either facility further inhibits their usefulness by forcing most events into fall, winter, and spring months. Inadequate capacity for mass spectator events is attested to by the heavy event schedules which both buildings support.

In addition to an unambiguous quantitative shortage of such facilities in Boston is the evident qualitative limitations of the facilities related to their age. The Boston Arena, a fine building when new, is old and technologically obsolete. Its poor location and aged condition are incompatible with the needs of a dynamic modern urban area such as Boston. The need for better facilities to serve the Boston area is strongly evident.

The problem of defining the appropriate structural requirements to rebuild the Boston Arena, replace it, or supplement it, however, is a complex one. For this reason, the Boston Arena Authority retained several expert consultants to accumulate and array data pertinent to the problem. R. G. Heim and the consultant firms of Darley/Gobar Associates, Inc. (economists) and Finch-Heery (architects and engineers) were retained to provide data to the members of the Authority to aid them in determining the appropriate policies with regard to possible courses of action. Pro forma event schedules, operating income and expense projections, and construction cost factors were prepared in a format to permit the Authority to evaluate the

economic implications of a range of reasonable alternatives.

Two reports have been prepared. One (Report A) deals with providing facilities for the activities currently being accommodated by the Boston Arena. The other (Report B) deals with the economic and physical design implications of constructing and operating a larger facility to accommodate local mass spectator facility requirements not currently being served or being served somewhat imperfectly by existing facilities.

One policy option to be considered deals with the possibility of replacing the current Boston Arena with a facility that has capabilities to accommodate an increased proportion of the events that a community such as Boston can support. One way that expanded capacity could be achieved is by constructing a larger facility, compatible with a broader range of events. The present Boston Arena is scheduled almost to capacity in terms of potential event days. Constructing a larger, new arena to accommodate a different schedule would imply displacement of some events which would be held in a smaller arena.

Another option is to build a complex consisting of both a large and a small arena with twice the event day schedule capacity of either a large or small arena. Such a complex would also offer greater flexibility of usage and scheduling.

CHAPTER II

SUMMARY AND CONCLUSIONS

1. Boston, as one of the largest urban areas in the U.S., generates demands for from 700-775 event days of arena usage per year. The two existing arenas provide capacity for about 450 event days per year. Because of the tight scheduling dictated by such a situation, much compromise is required in the total spectrum of events scheduled in the available facilities in Boston.
2. The existing Boston Arena, in spite of being obsolete, meets some very specific needs of the community. If and when it ceases to function, the community's recreation resource base will be substantially attenuated. Construction of a new, similar sized arena or renovation of the existing facility represent substantial expenditures without significantly altering the Boston area's mass spectator event capacity.
3. The heavy schedule of events at the Boston Garden is related to the Boston market's phenomenal support of hockey, the size of the market area population and to the limited availability of the facility during summer months when its lack of air conditioning renders it not fully usable. As a result the demand for events requiring seating capacity over 12,000 exceeds the available capacity.
4. The schedule of events at a new large arena in Boston would depend on what events would be likely to move from the Boston Garden to the new arena. For this reason three different pro forma schedules of events are forecasted for a potential new arena. The different event schedules would result in three different revenue projections defined as

Levels #1, 2, and 3 in the body of the report.

5. Construction of a new, large arena and the possible closing of the existing Boston Arena would leave still unaccommodated a substantial potential schedule of events. If a complex consisting of a large (12,000 seat) arena and a small (6,000 seat) arena were to be built, each facility would easily have a 225 event day schedule. Such a schedule represents about the maximum for most facilities of this type. The net result would be replacement of existing capacity with new facilities capable of operating during summer months.
6. A new large arena in Boston could expect to receive gross revenues of from \$.96 to \$1.250 million per year depending on the competitive effects from the Boston Garden. Annual operating expenses of \$450,000 would leave from \$540,000 to \$830,000 per year for debt service.
7. A two arena complex could generate annual operating revenues of from \$1.08 million to \$1.509 million per year, depending on the competitive effects of the existing Boston Garden. Annual operating expenses of \$530,000 per year would leave from \$580,000 to \$1,018,000 per year for debt service. In no case would the operating surplus be adequate to amortize the debt required to construct the facilities (Exhibit II-1).
8. Other sources of support for the construction debt include direct capital contributions for providing a permanent practice track for school boy use and parking income from controlled parking at one of the sites considered.
9. Although under none of the options considered does the proposed facility produce enough income to cover full costs of construction, there are

ancillary benefits to be considered as partially offsetting the cost. In the case of operating an Arena facility at either the North Station or South Station site, the parking revenues of \$300,000 to \$475,000 per year represent a substantial benefit to garage operations adjacent to the facility. Also, existence of a new, large arena would permit Boston to attract a greater proportion of large conventions. The attendant new spending would have a positive impact on local hotels, restaurants, etc. creating a total increase of \$15-30 million per year in salaries, rents, and profits for residents in the greater Boston economy.

EXHIBIT II-1

SUMMARY OF NET UNSUPPORTED DEBT FOR VARIOUS ARENA OPTIONS

(All Figures in Millions of Dollars)

Facility and Location	Operating Level*	Con-struction Cost	Debt Support From Operations and Parking	Contrib. From Track	Net Unsupported Debt
<u>LARGE ARENA</u>					
Kendall Square	#1	\$23.84	\$13.58	\$ 1.81	\$ 8.45
	#2	23.84	17.72	1.81	4.31
	#3	23.84	20.28	1.81	1.75
North Station	#1	22.04	9.20	1.81	11.03
	#2	22.04	12.60	1.81	7.63
	#3	22.04	14.30	1.81	5.93
South Station	#1	21.75	9.20	1.81	10.74
	#2	21.75	12.60	1.81	7.34
	#3	21.75	14.30	1.81	5.64
<u>TWO ARENA COMPLEX</u>					
Kendall Square	#1	39.57	14.63	1.84	23.10
	#2	39.57	22.24	1.84	15.49
	#3	39.57	25.14	1.84	12.59
North Station	#1	30.08	10.00	1.84	18.24
	#2	30.08	15.60	1.84	12.64
	#3	30.08	17.50	1.84	10.74
South Station	#1	29.58	10.00	1.84	17.74
	#2	29.58	15.60	1.84	12.14
	#3	29.58	17.50	1.84	10.24

* Level #1 - Celtics move to new arena (no hockey); Level #2 - Celtics and NHL move to new arena; Level #3 - Boston Garden not operating.

Source: Darley/Gobar Associates, Inc.

CHAPTER III

MARKET DEMAND FOR ARENA USAGE

Boston is one of the largest U.S. markets for mass spectator events. It ranks sixth in the U.S. in total population in the metropolitan area (Exhibit III-1). Because of the heavy support which mass spectator events draw from the more affluent elements in the population, the area's population of more than 650,000 households with annual incomes over \$8,000 is particularly significant in determining the area's potential to utilize public spectator facilities (Exhibit III-2).

The City of Boston is essentially the administrative core of the Boston Standard Metropolitan Statistical Area. Like many core areas, Boston's population has been declining. The decline, however, is expected to subside and population stabilization and perhaps slight growth can be projected for the core area. Unlike many urban core areas, the City of Boston's employment base is growing both in number of jobs and in output. Boston has about 25 percent of the metropolitan area's population and produces nearly 50 percent of the total metropolitan area's output.

Employment patterns in the metropolitan area are more heavily oriented to financial firms and service activities than in the U.S. as a whole (Exhibit III-3). On the other hand, the Boston economy is less dependent on manufacturing jobs than are the economies of the greater Boston metropolitan area and the U.S. The net effect of these relationships is that Boston is a financial and administrative center with a large employment base. The pattern of income and occupations that are derivative of this is one especially compatible with strong support of mass spectator events.

More significant than abstract analyses of the area's economic statistics, however, is the actual history of fan support of sports in Boston.

In spite of relatively obsolete facilities, the Boston Standard Metropolitan Statistical Area in 1967 (the most recent year for which data are available) enjoyed the seventh highest level of sports receipts of any metropolitan area in the U.S. It had a per capita level of sports expenditure higher than most areas except for those such as Miami and New York which benefit from large tourist expenditure (Exhibit III-4). The market's socio-economic profile with large numbers of higher income families and with large percentages of managerial and professional/technical occupations represented in the population is consistent with a strong sports and entertainment market (Exhibit III-5).

Boston is the home of major league teams in most sports. In 1970, the Boston Red Sox had better attendance than any other American League Team. The same was true in 1969 and 1967. In 1968, the Red Sox were second in total attendance (Exhibit III-6).

Low attendance at Patriot games in the 1966-1970 period can be attributed to the poor stadium (Exhibit III-7). Playing in the new Foxboro Stadium, in spite of its non-central location and distance from the population centers, the Patriots have attracted substantially greater gates in 1971.

Although the NBA Boston Celtics rank about eighth in total attendance (Exhibit III-8), part of the relatively poor attendance can be accounted for by the extremely tight schedule at the Boston Garden where NHL, AHL, and NBA teams compete for prime dates. Hockey attendance for the Boston Bruins in the NHL is nearly 99 percent of the Boston Garden's capacity

(Exhibit III-9), indicative of strong support and preferential dates. It should be pointed out that market support for hockey in Boston is extraordinary for both the NHL and the AHL teams playing in the Boston Garden. In fact, 43.6 percent of the Garden's schedule in 71/72 was some form of professional hockey.

The future is bright for professional sports, shows, amateur sports and other arena events in Boston. Population of the metropolitan area is expected to continue to rise. Employment increases are forecast, not only for the metropolitan area but also for the core represented by the City of Boston.

The labor force in Boston is more productive than is the labor force in the U.S. as a whole. Workers throughout the metropolitan area are more efficient and, hence, more productive, and as a result more affluent than the average worker in the U.S. The result is that the market potential for arena events in Boston will continue to grow, putting more pressure on the already inadequate existing facilities.

In addition to the established and demonstrated market for arena-type activities in Boston, it can be anticipated the demand for such activities will continue to grow. Expenditures for admissions to spectator sports - only one element in the spectrum of arena events - continue to rise nationally (Exhibit III-10).

Growth in attendance at NBA games continues. Between the 1965-1966 season and the 1970-71 season, total attendance at NBA games rose 130 percent; and the number of active teams increased by 89 percent (Exhibit III-11).

Growth of attendance at NBA games is only part of the evidence of increasing

support of this sports activity. The new ABA basketball league had total attendance of over 2 million in 1970-71, a growth of 85 percent from the 1967-68 season (Exhibit III-12), and representing another manifestation of market support for this type of sports activity.

Among the most phenomenal growth stories in professional sports is the record of the NHL. Between the 1964-65 season and the 1969-70 season, attendance increased by 135 percent (Exhibit III-13). Probably, even more significant, is the evidence that were larger arenas available, total hockey attendance could be much higher. Eleven out of 14 NHL franchises had attendance in the 1970-71 season that exceeded 90 percent of their arenas' capacities (Exhibit III-9). In Boston, the strong spectator demand is being met by the support of two professional hockey teams - one NHL and one AHL team - playing in the same arena.

Demand for arena facilities in Boston is further evidenced by the heavy schedules. Most large arenas consider a 200-225 day schedule to be the maximum capacity of the building. The Boston Garden, which because of lack of air conditioning is largely dark for three months a year, crowds a 216 day schedule into nine months. The old, obsolete, poorly located Boston Arena, operating with inadequate parking and substandard facilities, operates a 156 event day schedule in addition to a heavy schedule of practice sessions for amateur hockey.

EXHIBIT III-1

POPULATION CHARACTERISTICS OF CITIES HAVING
MAJOR LEAGUE BASKETBALL AND/OR HOCKEY

Metropolitan Area	Teams In:*	Total Population (000)	Urban Population (000)	Percent of Urban Population
New York	NHL, NBA	11,589.9	11,406.3	98.4
Los Angeles	NHL, NBA	7,128.2	7,033.4	98.7
Chicago	NHL, NBA	7,023.6	6,725.8	95.8
Philadelphia	NHL, NBA	4,815.4	4,293.5	89.2
Detroit	NHL, NBA	4,241.5	4,050.8	95.5
BOSTON	NHL, NBA	3,344.3	3,083.3	92.2
San Francisco-Oakland	NHL, NBA	3,151.9	3,077.1	97.6
Montreal	NHL	2,455.3	2,450.7	99.8
Pittsburgh	NHL, ABA	2,394.3	1,989.8	83.1
St. Louis	NHL	2,367.1	2,033.4	85.9
Toronto	NHL	2,272.9	2,219.9	97.7
Baltimore	NBA	2,088.4	1,759.7	84.3
Cleveland	NBA	2,072.9	1,948.9	94.0
Houston	NBA	2,037.9	1,833.3	90.0
Minneapolis-St. Paul	NHL	1,825.3	1,739.6	95.3
Dallas	ABA	1,597.3	1,482.1	92.8
Seattle	NBA	1,436.4	1,271.0	88.5
Atlanta	NBA	1,413.4	1,206.5	85.4
Milwaukee	NBA	1,397.7	1,300.1	93.0
Cincinnati	NBA	1,388.9	1,170.4	84.3
Buffalo	NHL, NBA	1,349.9	1,146.4	84.9
Miami	ABA	1,301.4	1,279.6	98.3
Denver	ABA	1,252.1	1,177.0	94.0
Vancouver	NHL	1,190.7	1,046.2	87.9
Indianapolis	ABA	1,119.1	921.7	82.4
Portland, Oregon	NBA	1,028.3	856.5	83.3
Phoenix	NBA	992.0	927.0	93.5
Louisville	ABA	837.0	756.5	90.4
Hempstead Township, N.Y.	ABA	800.7	---	---
Memphis	ABA	786.7	726.2	92.3
Norfolk	ABA	686.8	674.2	98.2
Greensboro	ABA	612.6	399.9	65.3
Salt Lake City	ABA	562.9	525.9	93.4
Richmond, Va.	ABA	523.8	434.0	82.9
Charlotte, N.C.	ABA	414.7	299.7	72.3
Newport News-Hampton, Va.	ABA	292.3	266.6	91.2
Raleigh, N.C.	ABA	232.2	161.4	69.5

* Key:

A: American
N: NationalB: Basketball
H: HockeyL: League
A: AssociationSource: Sales Management, 1971 Survey of Buying Power, July 10, 1971

EXHIBIT III-2

FAMILY INCOME IN CITIES WITH MAJOR LEAGUE BASKETBALL AND/OR HOCKEY

Metropolitan Area	Effective Buying		% of Households with Income Over \$8,000	Estimated Number of Households (000's)	Number of House- holds with Income Over \$8,000 (000's)
	Per Capita	Income 1970 Per Household			
New York	\$ 4,221	\$12,616	59.9	3,877.3	2,322.5
Los Angeles	4,088	11,782	56.9	2,473.4	1,407.4
Chicago	4,151	13,227	66.3	2,204.5	1,461.6
Philadelphia	3,598	11,677	57.5	1,483.9	853.2
Detroit	3,785	12,498	64.5	1,284.5	828.5
BOSTON	3,929	12,649	62.7	1,038.9	651.4
San Francisco-Oakland	4,111	11,746	58.0	1,103.1	639.8
Montreal	2,897	10,222	55.5	702.3	284.4
Pittsburgh	3,421	10,789	53.3	759.2	404.7
St. Louis	3,452	11,100	55.7	736.2	410.1
Toronto	3,147	11,129	41.9	646.9	271.1
Baltimore	3,335	11,044	45.3	630.7	285.7
Cleveland	3,938	12,472	64.1	654.5	419.5
Houston	3,380	10,936	53.3	629.9	335.7
Minneapolis-St. Paul	3,837	12,457	65.7	562.2	369.4
Dallas	3,625	11,414	54.6	507.3	277.0
Seattle	3,816	11,429	58.1	479.6	278.6
Atlanta	3,645	11,793	57.4	436.9	250.8
Milwaukee	3,724	12,055	63.5	431.8	274.2
Cincinnati	3,453	11,063	55.0	433.5	238.4
Buffalo	3,517	11,306	59.3	419.9	249.0
Miami	3,408	10,040	45.9	441.7	202.7
Denver	3,469	10,876	53.0	399.4	211.7
Vancouver	2,754	8,686	30.4	373.2	113.5
Indianapolis	3,548	11,293	56.8	351.6	199.7
Portland, Oregon	3,522	10,393	52.0	348.5	181.2
Phoenix	3,348	10,677	51.1	311.1	159.0
Louisville	3,337	10,687	52.9	261.4	138.3
Hempstead Township, N.Y.	N.A.				
Memphis	2,788	9,417	43.1	232.9	100.4
Norfolk	2,638	9,296	39.4	194.9	76.8
Greensboro	3,334	10,717	51.9	190.6	98.9
Salt Lake City	3,063	10,742	55.2	160.5	88.6
Richmond, Va.	3,278	10,361	48.1	165.7	79.7
Charlotte, N.C.	3,475	11,331	53.6	127.2	68.2
Newport News-Hampton, Va.	2,943	10,354	49.0	83.1	40.7
Raleigh, N.C.	3,466	11,699	52.2	68.8	35.9

Source: Sales Management 1971 Survey of Buying Power, July 10, 1971.

EXHIBIT III-3

EMPLOYMENT PROFILE
CITY OF BOSTON AND BOSTON METROPOLITAN AREA

	City of Boston	Metropolitan Area	U.S.
Agriculture & Mining	0.1	0.3	5.5
Construction	3.5	4.2	4.5
Manufacturing	12.5	22.6	26.2
Transportation, Communication & Utilities	8.4	6.2	6.1
Wholesale Trade	8.0)	6.6)	20.2
	) 23.3	) 23.7	
Retail Trade	15.3)	17.1)	
Finance, Insurance, & Real Estate	14.3	7.6	4.9
Services	22.6	24.3	15.6
Government	<u>15.3</u>	<u>11.1</u>	<u>17.0</u>
TOTAL:	100.0	100.0	100.0

Source: Statistical Abstract of the U.S. The Expanding City of Boston Economy (Boston Redevelopment Authority Research Department Community Renewal Program).

EXHIBIT III-4

SPORTS RECEIPTS LEVELS FOR SELECTED METROPOLITAN AREAS, 1967

Metropolitan Area	Total Population 12/31/67 (000)	Commercial Sports*		
		Total Number of Establishments	Total Receipts (000)	Receipts Per Capita
New York	11,625.6	130	\$ 130,347	\$ 11.21
Los Angeles	7,027.0	77	56,931	8.10
Philadelphia	4,785.3	51	29,953	6.26
Detroit	4,113.8	57	33,349	8.11
BOSTON	3,237.2	27	28,308	8.74
San Francisco-Oakland	3,079.2	41	31,619	40.27
Washington, D.C.	2,688.5	39	14,974	5.57
Pittsburgh	2,380.0	18	9,782	4.11
St. Louis	2,331.3	29	16,042	6.88
Cleveland	2,078.6	20	13,928	6.70
Baltimore	2,005.5	32	22,102	11.02
Houston	1,808.5	17	8,576	4.74
Dallas	1,430.5	20	4,234	2.96
Milwaukee	1,377.8	8	901	0.65
Atlanta	1,278.6	6	7,592	5.94
San Diego	1,253.8	15	10,138	8.09
Buffalo	1,330.7	20	5,845	4.39
Miami	1,139.9	70	31,786	27.88
Denver	1,131.3	13	7,092	6.27
New Orleans	1,075.4	30	9,277	8.63
Indianapolis	1,049.0	13	6,876	6.55
Portland	931.8	15	4,392	4.71
Phoenix	895.6	20	5,916	8.61
Providence	827.3	17	12,176	14.72
Greensboro	591.5	8	789	1.33
Charlotte	386.9	6	2,265	5.85
			Average	8.17

* Includes baseball, football, basketball, hockey, sports promoters, horse racing, dog racing, auto and motorcycle racing, and racing stables.

Source: 1967 Census of Business, Selected Services, Area Statistics, Bureau of the Census, Washington D.C., Issued 1970. Population from Sales Management Survey of Buying Power, June 10, 1968.

EXHIBIT III-5

CONSUMER DEMAND AND EXPENDITURES FOR SPORTS EVENTS

All Non-farm Families and Single Consumers				
Consumer Characteristics		Estimated 1966 Distribution of All Families %	Estimated 1966 Distribution of Demand For Sports Events	1960-61 Average Annual Expenditures for Sports Events (\$)
Family Income (Before Taxes)	Under \$3,000	16.0	1.5	\$.65
	\$ 3,000 - 5,000	15.0	6.0	2.75
	5,000 - 7,500	21.0	15.5	5.12
	7,500 - 10,000	19.0	21.0	7.39
	10,000 - 15,000	29.0	56.0	10.56
	15,000 and Over			18.81
Earner Compo- sition of Family	Husband Working Only	29.5	31.0	5.26
	Husband & Wife Only	23.0	28.0	6.07
	Husband & Other			
	Combination	11.5	25.0	11.08
Occupa- tion of Head	All Other	36.0	16.0	2.24
	Professional Tech.	12.0	18.0	7.56
	Managers, Officials	12.0	22.5	9.46
	Clerical & Sales	11.5	14.5	6.35
	Foreman, Craftsmen	16.0	18.0	5.80
	Operatives	16.5	15.0	4.66
Geo- graph- ical Region	All Other	32.0	12.0	2.02
	Northeast	26.5	23.0	4.50
	North Central	27.0	29.0	5.47
	South	29.0	26.5	4.53
Color	West	17.5	21.5	6.38
	White	88.5	92.5	5.31
	Non-white	11.5	7.5	3.24
Market Loca- tion	Central Cities	33.0	35.5	5.49
	Urban Fringe	29.0	36.0	6.31
	Other Areas	6.5	6.5	5.23

Source: Market Profiles of Consumer Products, 1967 and
Expenditure Patterns of The American Family, 1965, Fabian Linden,
 Editor, National Industrial Conference Board, Sponsored by Life.

MAJOR LEAGUE BASEBALL ATTENDANCE, 1966 - 1970

	1966	1967	1968	1969	1970	% Change 1966-1970
<u>National League</u>						
Atlanta	1,539,801	1,340,564	1,126,540	1,458,320	1,078,848	
Chicago	665,881	977,984	1,043,409	1,664,857	1,642,705	
Cincinnati	742,958	949,849	733,354	987,991	1,803,568	
Houston	1,872,108	1,333,862	1,312,887	1,442,995	1,253,444	
Los Angeles	2,617,059	1,663,599	1,581,093	1,784,527	1,697,142	
Montreal	-----	-----	-----	1,212,608	1,424,683	
New York	1,933,693	1,565,492	1,781,657	2,175,373	2,697,479	
Philadelphia	1,108,201	824,252	664,546	519,609	708,247	
Pittsburgh	1,196,618	904,121	693,485	769,369	1,341,947	
St. Louis	1,712,980	2,100,838	2,011,167	1,682,583	1,629,736	
San Diego	-----	-----	-----	609,562	643,679	
San Francisco	1,657,192	1,232,400	837,220	873,603	740,720	+10.7
TOTAL	15,046,491	12,893,961	11,785,358	15,181,397	16,662,198	- 7.7
Average Per Team	1,504,649	1,289,396	1,178,536	1,265,116	1,388,517	
<u>American League</u>						
Baltimore	1,203,366	858,822	943,977	1,000,811	1,057,069	
Boston	811,172	1,692,339	1,940,788	1,833,302	1,595,278	
California (Orange Co.)	1,400,321	1,301,557	1,025,956	758,387	1,077,741	
Chicago	990,016	966,284	803,775	589,546	495,355	
Cleveland	903,359	685,698	857,994	619,970	729,752	
Detroit	1,124,293	1,445,184	2,031,847	1,577,481	1,501,305	
Kansas City	773,929	652,246	-----	902,183	693,047	
Milwaukee	-----	-----	-----	-----	933,690	
Minnesota	1,259,374	1,483,421	1,143,257	1,349,327	1,261,887	
New York	1,124,648	1,141,714	1,185,666	1,067,996	1,136,879	
Oakland	-----	-----	837,466	778,332	778,355	
Seattle	-----	-----	-----	680,495	-----	
Washington	576,260	770,888	546,661	914,160	824,789	+18.9
TOTAL	10,166,738	10,998,153	11,317,387	12,071,990	12,085,147	- 0.9
Average Per Team	1,016,674	1,099,815	1,131,739	1,005,999	1,007,096	

Source: Various league books and newspaper articles.

EXHIBIT III-7

NATIONAL FOOTBALL LEAGUE ATTENDANCE 1966-1970

(Page 1 of 2 pages)

Team	Total Home Game Attendance (7 Games)					Average Attendance Per Game				
	1966	1967	1968	1969	1970	1966	1967	1968	1969	1970
<u>National Football Conference</u>										
<u>Eastern Division</u>										
Dallas	473,373	460,476	470,110	444,110	411,528	67,625	65,782	67,159	63,476	58,790
New York Giants	439,905	440,043	440,115	440,282	440,333	62,844	62,863	62,874	62,897	62,905
Philadelphia	407,196	424,868	412,573	424,606	399,190	58,171	60,695	58,939	60,658	57,027
St. Louis	317,166	316,923	327,377	329,529	332,123	45,309	45,275	46,768	47,076	47,446
Washington	348,094	353,149	354,535	352,860	352,904	49,728	50,450	50,648	50,409	50,415
<u>Central Division</u>										
Chicago	327,587	320,550	318,173	315,198	321,437	46,798	45,793	45,453	45,028	45,920
Detroit	358,181	368,443	359,430	383,627	401,200	51,169	52,635	51,347	54,804	57,314
Green Bay	349,442	352,586	352,080	348,105	369,084	49,920	50,369	50,297	49,729	52,726
Minnesota	315,837	304,901	328,072	328,614	336,300	45,120	43,557	46,867	46,945	48,043
<u>Western Division</u>										
Atlanta	395,679	384,891	355,360	363,194	386,083	56,526	54,984	50,766	51,885	55,154
Los Angeles	348,432	419,997	455,891	497,503	499,427	49,776	60,000	65,127	71,072	71,347
New Orleans	---	528,242	519,426	521,133	483,235	---	75,463	74,204	74,448	69,034
San Francisco	249,892	253,286	237,561	242,209	311,774	35,699	36,184	33,937	34,601	44,539
<u>American Football Conference</u>										
<u>Eastern Division</u>										
Baltimore	418,143	418,143	418,292	414,918	415,351	59,735	59,735	59,756	59,274	59,336
Boston	190,138	138,861*	156,459	149,412	245,537	27,163	23,144	22,351	21,345	35,077
Buffalo	299,127	280,461	251,804	281,648	277,966	42,732	40,066	35,972	40,235	39,709
Miami	182,428	197,710	215,980	242,815	440,139	26,061	28,244	30,854	34,688	62,877
New York Jets	415,768	437,036	433,760	446,422	439,688	59,395	62,434	61,966	63,775	62,813

* Six Games

Exhibit III-7

National Football League Attendance 1966-1970

Page 2 of 2 pages

Team	Total Home Game Attendance (7 Games)				Average Attendance Per Game					
	1966	1967	1968	1969	1970	1966	1967	1968	1969	1970
American Football Conference (Continued)										
Central Division										
Cleveland	544,250	544,807	528,057	578,360	567,827	77,750	77,830	75,437	82,623	81,118
Pittsburgh	249,331	271,522	235,051	282,968	323,379	35,619	38,789	33,579	40,424	46,197
Cincinnati	-----	-----	180,337	191,091	407,757	----	----	25,762	27,299	58,251
Houston	177,896	185,129	282,843	309,420	294,479	25,414	26,447	40,406	44,203	42,068
Western Division										
Denver	192,769	231,801	281,315	327,138	355,443	27,538	33,114	40,188	46,734	50,778
Kansas City	259,071	315,006	338,911	345,519	354,480	37,010	45,001	48,416	49,360	50,640
Oakland	253,508	276,488	328,265	371,714	381,519	36,216	39,498	46,895	53,102	54,503
San Diego	189,664	297,312**	303,188	324,178	315,549	27,095	37,164	43,313	46,311	45,078
Total	7,702,877	8,522,631	8,884,965	9,256,797	9,863,732	45,850	48,701	48,818	50,862	54,196

Percent Growth, 1966-1970 = 28.1

Percent Growth, 1966-1970 = 18.2

**Eight Games.

Source: League Books and Statistics Published in Sporting News. Calculations by Darley/Gobar Associates, Inc.

NATIONAL BASKETBALL ASSOCIATION 1970-71 ATTENDANCE BREAKDOWN

Team	Site	# of Games	Total Attendance	Average Per Game	Arena Capacity	% Capacity
New York	New York	42	773,933	18,426	19,500	94.50%
Los Angeles	Los Angeles	40	551,000	13,775	17,643	78.08
Milwaukee	Milwaukee	36	378,106	10,503	10,746	97.74
	Madison	5	40,781	8,156	10,190	80.04
Chicago	Chicago	41	406,763	9,921	17,374	57.10
Seattle	Seattle	35	333,036	9,515	12,382	76.85
	Univ. of Washington	6	42,745	7,124	11,600	61.41
Philadelphia	Philadelphia	38	326,421	8,590	15,244	56.35
Boston	Boston	38	311,182	8,189	15,128	54.13
Phoenix	Phoenix	41	332,145	8,101	12,096	66.97
Detroit	Detroit	40	277,729	6,943	11,009	63.12
San Diego	San Diego	39	264,124	6,772	14,000	48.37
Baltimore	Baltimore	37	221,307	5,981	12,384	48.30
	College Park, Md.	4	28,823	7,206	17,000	42.30
Portland	Portland	39	236,088	6,053	13,000	46.57
Atlanta	Atlanta	41	245,555	5,986	6,996	85.61
San Francisco	San Francisco	25	117,056	4,682	14,500	32.29
	Oakland	13	90,504	6,962	14,000	49.73
Buffalo	Buffalo	36	181,196	5,033	10,683	47.11
	Syracuse	2	3,620	1,810	N.A.	---
	Rochester	2	2,712	1,356	N.A.	---
Cincinnati	Cincinnati	33	133,859	4,056	12,155	33.37
	Omaha, Neb.	6	25,060	4,177	N.A.	---
	Toronto	1	11,599	11,599	N.A.	---
Cleveland	Cleveland	40	141,130	3,528	11,000	32.07
	Total*	680	5,476,474	8,054		

* Does not include one game between San Francisco and New York played at St. Louis (Att.-12,482) and one game between Chicago and Cincinnati played at Los Cruces, N. Mex. (Att.-9,097). There were also nine games played as doubleheaders but attendance was attributed to home team only. Totals do not agree with those officially announced by NBA - 5,330,393 attendance at 697 regular season games.

Source: Box scores from Sporting News and the Official National Basketball Association Guide.

EXHIBIT III-9

NATIONAL HOCKEY LEAGUE
1970-71 ATTENDANCE BREAKDOWN

Team	Number of Games	Total Attendance	Average Per Game	Arena Capacity	% Capacity
Chicago	38	723,950	19,051	20,000	95.26
St. Louis	36	656,501	18,236	18,250	99.92
New York	36	620,682	17,241	18,000	95.78
Montreal	37	629,077	17,002	17,500	97.15
Toronto	36	585,824	16,273	17,179	94.73
Vancouver	38	578,909	15,234	15,573	97.82
Boston	38	568,752	14,967	15,300	97.82
Minnesota	38	550,867	14,497	15,000	96.65
Philadelphia	36	507,250	14,090	15,000	93.93
Detroit	38	497,424	13,090	14,500	90.28
Pittsburgh	37	369,663	9,991	12,000	83.26
Buffalo	38	367,929	9,682	10,000	96.82
Los Angeles	37	350,003	9,460	16,000	59.13
Oakland	37	217,135	5,869	12,500	46.95
Total*	520	7,223,966	13,892	---	---

* Regular season games only.

Source: Box scores from Sporting News and AudArena Stadium, 1972 Edition, Fall 1971.

EXHIBIT III-10

U. S. EXPENDITURE FOR ADMISSION TO SPECTATOR SPORTS

Year	Expenditure	Change in Expenditure
1964	\$365,000,000	
1965	389,000,000	\$24,000,000
1966	414,000,000	25,000,000
1967	436,000,000	22,000,000
1968	453,000,000	17,000,000
1969	487,000,000	34,000,000
1970	516,000,000	29,000,000

Source: Survey of Current Business, July Issue,
Various Years.

EXHIBIT III-11

NATIONAL BASKETBALL ASSOCIATION ATTENDANCE

Year	Number of Teams	Total Season Attendance	Average Attendance/Team
1965-66	9	2,314,637	257,182
1966-67	10 ⁽¹⁾	3,102,116	310,212
1967-68	12 ⁽²⁾	3,649,511	304,126
1968-69	14 ⁽³⁾	4,427,297	316,235
1969-70	14	5,146,858	367,633
1970-71	17 ⁽⁴⁾	5,330,393	313,552

(1) Chicago added

(2) San Diego and Seattle added

(3) Milwaukee and Phoenix added

(4) Buffalo, Cincinnati, and Portland added

Source: National Basketball Association.

EXHIBIT III-12

AMERICAN BASKETBALL ASSOCIATION ATTENDANCE

Year	Number of Teams	Total Season Attendance	Average Attendance Per Team
1967-68	11	1,200,439	109,131
1968-69	11	1,275,646	115,968
1969-70	11	1,752,993	159,363
1970-71	11	2,230,061	202,733

Note: The early years were characterized by several moves and team disbandments. The figures prior to 1970 are approximate, but the best estimates available from the league office.

Source: American Basketball Association.

EXHIBIT III-13

NATIONAL HOCKEY LEAGUE ATTENDANCE

Year	Number Of Teams	Total Attendance	Average Per Game
1964-65	6	2,822,986	13,442
1965-66	6	2,941,164	14,006
1966-67	6	3,084,759	14,689
1967-68	12	4,938,043	11,223
1968-69	12	5,550,613	12,172
1969-70	12	6,636,322	14,002
1970-71	14	7,257,677	13,292

Source: National Hockey League, Publicity Department, Montreal.

CHAPTER IV

FACILITY REQUIREMENTS

The optimum facility to be constructed is essentially a compromise between the event schedule required to meet the area's needs and the cost of providing and maintaining the facilities.

Event Schedules

Currently, the Boston Garden schedules 216 event days per year in a nine month season. This is an extremely heavy schedule (Exhibit IV-1). Because it is being operated by a private entity, the Boston Garden must concentrate on the most profitable events. Indeed, nearly 85 percent of the schedule is composed of professional sports and entertainment events, displacing less profitable civic, cultural, and public interest functions to other facilities or precluding their occurrence in Boston.

In spite of its location, poor physical condition, size, and other limitations, the old Boston Arena also has a heavy schedule with public service events predominating. The Boston Arena schedule is made up largely of amateur hockey with a large amount of practice usage which does not appear on the schedule (Exhibit IV-2). The other major indoor facility in Boston is the John B. Hynes Auditorium. It, too, has a heavy schedule of 171 event days considering the special orientation of the facility and limitations on its use imposed by its largely single purpose design (Exhibit IV-3).

The heavy schedule at local facilities is related to the Boston Metropolitan Area's size, its special mania for hockey, and to the relatively inadequate capacity of existing facilities (Exhibit IV-4). For comparison

purposes, many communities that are smaller than Boston have more scheduled events in entertainment, sports, conventions, and Civic activities (Exhibit IV-5). Boston has an especially strong demand for arena facilities because of the AHL team which by itself could constitute 20 percent of a typical arena's schedule and also because of the need for hockey practice areas. As a result, many events - track meets, boxing shows, religious meetings, and conventions - are pre-empted from using the only existing large arena in Boston. The basic elements in an arena's schedule are professional sports, amateur sports, circuses/rodeos, stage shows and concerts, ice shows, trade shows, and conventions. If unlimited facilities were available, Boston could easily support a schedule of 700-775 event days per year (Exhibit IV-6, Column A).

Professional Sports. A representative arena in a larger city typically schedules 80 event days per year of professional basketball and hockey. In some arenas, a strong program of professional boxing accounts for another 30 event days per year, and wrestling and roller games can each add 20 event days per year for a total potential schedule of 150 event days per year from these professional sports activities alone. In Boston, the sports potential related to fan support for the AHL hockey team adds an additional 40 event days to the demand potential. If closed circuit TV for major boxing events and auto racing is added, the potential arena usage from this class of event in Boston is nearly 200 event days per year.

Amateur Sports. In some areas, college basketball is a major arena use. High school basketball tournaments are another potential use as are indoor track meets. In Boston there is the added dimension of substantial programs of amateur hockey. For an arena with dates available, an amateur

basketball schedule of 15 days for college and six days for high school tournaments would be perfectly feasible. In addition, a schedule of three to six days of track meets and, in Boston, 125 days of high school and college hockey would create a total potential schedule of approximately 150 event days of amateur sports.

Professional Entertainment. Concerts of rock groups, featured stars, etc. are a major user of large arenas in large urban market areas. The high concentration of colleges and universities in the Boston area gives this market even greater potential for entertainment events. In 1970, the Los Angeles Forum had 26 such concerts which drew an average of almost 14,000 spectators per event. In the same City, the Los Angeles Sports Arena hosted ten additional event days of comparable types of shows, and the Pauley Pavilion had six major concerts. Typical attractions are groups like the Led Zeppelin and individuals like Elvis Presley and Tom Jones. The Boston market is large enough to support at least 20-30 days a year of concert activity of a type with a large enough draw to require arena-scale seating capacity.

Circus/Rodeo. Circuses are a major tenant of arenas. The Boston Garden schedules 14 circus days per year. Other large markets schedule circuses up to 30 days per year. A reasonable potential schedule in Boston is 25 days per year. Were a facility available, it is expected that the market area would also support rodeos five to ten days per year. A conservative schedule of circuses and rodeos in Boston would be 30-35 potential event days per year.

Ice Shows. Holiday-on-Ice, Ice Capades, and Ice Follies represent a potential schedule of 30-40 event days per year. In the Los Angeles Forum in

1970, two ice shows presented 43 performances. In the same year the other major arena in Los Angeles scheduled two ice shows for 37 event days, making a total of 80 event days in the immediate Los Angeles area, excluding performances in Anaheim, etc.

Exhibits, Trade Shows, Conventions. These types of events produce little revenue but do provide a civic service and a conduit through which to attract convention spending to the local economy. The John B. Hynes Auditorium schedules about 170 days per year of such events. Use of an arena for conventions is fairly limited. Hotels can accommodate most conventions of 2,500 or less - depending on the amount of exhibit space required. Only about 25 percent of all large national conventions have attendance of over 2,500. Indeed, only 11 percent of all large national conventions have attendance of over 7,500, and 6 percent over 10,000 (Exhibit IV-7). Because of their low rental income potential, conventions are probably not actively sought by the Boston Garden - the only Boston facility with sufficient capacity to accommodate the larger conventions. The largest practical and available convention facility in Boston has a maximum capacity of about 5,000 (Exhibit IV-4), precluding the area from competing for large national conventions. As a result, only about 3 percent of the 151 scheduled conventions in Boston have attendance levels over 5,000 (Exhibit IV-8). To that extent, if an arena that could accommodate larger conventions were available in Boston, the City could compete for larger national conventions. There is potential for an additional six or seven major conventions per year in Boston, representing a potential arena schedule of 18-28 event days per year.

Trade shows and exhibits are of two types. Home shows, sports shows, boat

shows, car shows, etc. are essentially oriented to local consumers.

Promoters of such events like to have as much exhibit space as possible and would generally prefer the John B. Hynes Auditorium with its 150,000 square feet of exhibition space. A few shows are held at Suffolk Downs which also has large exhibition areas.

A by-product of constructing a major arena is the creation of from 25,000 to 50,000 square feet of additional exhibition space. Conventions with large attendance and modest requirements for exhibits are attracted to arena-type facilities but the total potential demand for exhibitions at a new arena is not expected to exceed ten days per year. The Los Angeles Sports Arena had 48 days of exhibit and trade shows in one twelve month period before completion of the L.A. Convention Center. Generally, however, because of the facility limitations, poor revenue potential and schedule conflicts, an arena should seek exhibits and conventions only as a filler between more lucrative events.

Other Events. Rallies, religious meetings, graduations, banquets, dog shows, and horse shows are frequently held in arenas to take advantage of the large seating and exhibit capacity. Generally, these activities produce only modest revenues and are used to fill voids in the schedules. For example, the Boston Garden probably schedules fewer than ten days per year of such activities, while in arenas in areas with less competition for available dates, these types of events can easily run to 50-60 days per year. Religious meetings usually draw very large audiences but produce low rents. Graduations and rallies often are sponsored by public or semi-public agencies and as a result also produce low levels of income. An area like Boston easily has demand for from 60-100 event days per year of this

type of miscellaneous semi-public service scheduling with attendance levels compatible with arena-seating capacity.

Scheduling Alternatives

In total, it is possible to identify demand for at least 700-775 days of potential arena usage in Boston. A typical arena in a large city could expect to have a schedule much like that shown in Exhibit IV-9. The actual schedule for a new Boston arena depends on how the demand is allocated between the available facilities. It is assumed, for instance, that practically all exhibits will continue to use the John B. Hynes Auditorium because it is physically more suitable for such events.

Another factor to consider is the competitive effect of the Boston Garden. Operated by the same group that controls the two professional hockey franchises in Boston, the Garden would probably continue heavy hockey schedules. A new, large arena could, however, expect to attract the Celtics who would be able to secure better schedule flexibility. It would also be able to appeal esthetically to such other lucrative events as the ice shows, circuses, and rodeos. The balance of the available schedule days could be made up of less lucrative events, as shown in Exhibit IV-10, Column A.

There is a possibility that the physical advantages of a new arena would permit it to attract the NHL team, leaving the AHL team in the Garden and creating an event schedule similar to that shown in Exhibit IV-10, Column C. Such a schedule would have two effects. It would place the Garden in a difficult financial position and result in a combined schedule for the Garden and a new large arena, as shown. There would still be inadequate capacity to accommodate all possible events, leaving a residual demand as indicated in Exhibit IV-10, Column F.

If a new smaller arena were to be build in conjunction with a new large building, it could accommodate many of these events, as shown in Exhibit IV-11, Column B. In the event that the Boston Garden were to be phased out of operation, the combined schedule at a new facility composed of a large main arena and a smaller auxiliary arena would be about as shown in Exhibit IV-12, leaving the unmet residual demand of 153 event days shown in the exhibit.

The schedule of events at the new facility will be related to two types of forces: The type of facility constructed and the future role of the Boston Garden.

The conditions to be considered are as follows:

- A. Replace the Boston Arena with a new larger arena.
- B. Replace the Boston Arena with a new complex composed of a large and a small arena.

The possible future policies of the Boston Garden operation are as follows:

- 1. Continue as at present, competing to hold as many of the most lucrative events as possible.
- 2. Actively seek to move some hockey events to the new arena.
- 3. Phase the Boston Garden out of operation.

These alternatives were considered in the analysis as representing three different potential operating levels for the proposed arena facility.

The event schedule for the new facility under each of the six most likely sets of circumstances are as follows:

A-1 Exhibit IV-10, Column A

A-2 Exhibit IV-10, Column C

A-3 Exhibit IV-10, Column G

B-1 Exhibit IV-11, Columns A & B

B-2 Exhibit IV-11, Columns D & E

B-3 Exhibit IV-12

In addition, the choice of site and the related construction cost differences adds yet another set of three factors to be considered.

Determination of the most appropriate policy for the Boston Arena Authority must inevitably involve analysis of the financial implications of each alternative combination of factors. The financial impact of each possible set of conditions is analyzed in Chapter VII.

EXHIBIT IV-1

EVENT SCHEDULE AT BOSTON GARDEN
SEPTEMBER 1971 THROUGH MAY 1972

Type of Event	Number of Event Days	Percent of Total
<u>Sports Events</u>		
Professional:		
Basketball - NBA	41	19.0%
Hockey - NHL	42	19.5
AHL	38	17.6
Wrestling	6	2.8
Roller Derby	2	0.9
Amateur:		
Basketball - College	2	0.9
Schoolboy	7	3.2
Hockey - College	9	4.2
Schoolboy	5	2.3
Track	2	0.9
<u>Entertainment Events</u>		
Variety Shows	10	4.6
Pageants, Spectaculars, etc.	13	6.0
Ice Shows	24	11.1
Circus, Rodeo, Horse Shows	14	6.5
<u>Other Events</u>		
Olympic Fund Raising	1	0.5
Total	216	100.0%

Source: Boston Gardens Schedule of Events, Season of 1971-72.
Tabulated and calculated by Darley/Gobar Associates, Inc.

EXHIBIT IV-2

EVENT SCHEDULE AT BOSTON ARENA, 1970-71

Type of Event	Number of Event Days	Percent of Total
<u>Sports Events</u>		
Professional	4	2.6
Amateur:		
College Hockey	34	21.8
Schoolboy Hockey	89	57.0
Other Amateur Sports	2	1.3
Closed Circuit TV	4	2.6
<u>Entertainment Events</u>		
Professional Entertainment	2	1.3
Circus	10	6.4
Ice Show	3	1.9
Pageants, etc.	1	0.6
<u>Other Events</u>		
Meetings, Revival, etc.	<u>7</u>	<u>4.5</u>
Total	156	100.0

Source: Boston Arena Management

EXHIBIT IV-3

JOHN B. HYNES CIVIC AUDITORIUM 1972 EVENT SCHEDULE

Event	Number of Event Days
Exhibitions, Shows (Open to the Public)	50
Exhibitions, Trade Shows (Private)	36
Conventions, Meetings, Banquets	76
Other Miscellaneous Events	9
Total	171

Source: John B. Hynes Civic Auditorium management.

EXHIBIT IV-4

EXISTING LARGE* INDOOR MASS SPECTATOR FACILITIES IN THE BOSTON AREA

	Seating Capacity		Exhibit Area		Meeting Rooms #	Size	Parking # Cars
	Total	Permanent	Main	Other			
Boston Garden	15,300	12,757	26,000	39,000	--	--	2,000
Boston Arena	6,898	5,458	--	--	--	--	--
John B. Hynes Civic Auditorium	5,826	1,826	150,000		10	25-800	--
Boston College Gym	4,200	3,000	--	--	--	--	--
Suffolk Downs	20,000	10,000	90,000	50,000	3	500-2,000	10,000
Ridge Arena-Braintree	5,000	3,000	17,000		--	--	1,250
North Shores Sports Center-Lynn	2,500	2,500	--	--	1	50	--

* Over 2,000 seating capacity.

Source: AudArena Stadium, 1972 Edition, Fall 1971.

EXHIBIT IV-5

REPRESENTATIVE SCHEDULES AT ARENAS IN OTHER CITIES

Event	Seattle Arena & Coliseum	Los Angeles Forum	Denver Arena & Coliseum	Phoenix Arizona Coliseum	San Diego Sports Arena	Dallas Arena	Cincinnati Gardens	Houston Coliseum
Professional Basketball & Hockey	80	90	78	80	79	--	40	--
Amateur Sports	36	7	23	4	3	9	5	4
Other Sporting Events	10	17	24	13	25	10	11	16
Name Entertainment Shows	26	26	18	13	16	18	11	2
Circus, Rodeos, Etc.	17	45	11	22	11	12	10	7
Ice Shows	11	43	11	12	18	13	16	18
Conventions	28	1	5	--	2	21	--	--
Exhibits, Trade Shows	49	--	16	9	6	11	16	--
Pageants, Rallies, Etc.	10	--	3	7	6	6	15	12
Other Misc. Events	59	--	35	7	1	30	4	--
Total	326	229	224	167	167	130	128	59

Source: Interviews and correspondence with management of various arenas.

EXHIBIT IV-6

ANALYSIS OF EVENT DAY SUPPLY AND DEMAND IN THE BOSTON AREA

FOR ARENA-TYPE EVENTS

Event	Total Demand in Area	1971 Event Day Schedules:				Total in Existing Facilities	Unmet Residual Demand
		-A-	-B-	-C-	-D-	-E-	-F-
Professional Sports	200	129	8	-	-	137	63
Amateur Sports	150	25	125	-	-	150	-
Professional Entertainment	20-30	10	2	-	-	12	8-18
Circus/Rodeo	30-35	14	10	-	-	24	6-11
Ice Shows	30-40	24	3	-	-	27	3-13
Disney, Pageants, etc.	20	13	1	-	-	14	6
Exhibits, Trade Shows	96	-	-	-	86	86	10
Conventions	94-104	-	-	-	76	76	18-28
Other Events	<u>60-100</u>	<u>1</u>	<u>7</u>	<u>9</u>		<u>17</u>	<u>48-83</u>
Total	700-775	216	156	171		543	157-232

Source: Darley/Gobar Associates, Inc.

EXHIBIT IV-7

SIZE DISTRIBUTION OF A SAMPLE OF LARGE NATIONAL CONVENTIONS

Attendance Range	Number	Percent	Cumulative Percent
0 - 49	-	-	-
50 - 99	-	-	-
100 - 149	-	-	-
150 - 199	1	-	-
200 - 299	6	2	2
300 - 399	12	4	6
400 - 499	8	3	9
500 - 999	66	21	30
1,000 - 2,499	109	36	66
2,500 - 4,999	45	15	81
5,000 - 7,499	25	8	89
7,500 - 9,999	15	5	94
10,000 +	19	6	100
	<u>306</u>	<u>100</u>	

Source: Real Estate Research Corporation Market Study & Economic
Analysis Proposed Convention Exhibition Center Indianapolis,
Indiana, August 1966.

EXHIBIT IV-8

SIZE DISTRIBUTION OF CONVENTIONS AND EXHIBITS HELD
IN BOSTON DURING 1971 BY TYPE OF FACILITY

Attendance Range	Conventions			Exhibits			Total Conv. & Exhibits
	At Hotel/Motel Facilities	At Other Facilities	Total	At Hotel/Motel Facilities	Hynes Auditorium	At Other Facilities	
0 - 100	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
100 - 149	6.9	0.0	6.7	0.0	0.0	0.0	0.0
150 - 199	5.5	0.0	5.3	0.0	0.0	0.0	0.0
200 - 299	13.1	0.0	12.7	7.8	0.0	0.0	5.5
300 - 399	16.6	0.0	16.0	0.0	0.0	0.0	0.0
400 - 499	9.0	0.0	8.7	3.9	0.0	0.0	2.7
500 - 599	33.1	40.0	33.3	15.7	5.3	0.0	12.4
1,000 - 2,499	13.8	0.0	13.3	37.3	21.1	0.0	31.5
2,500 - 4,999	1.4	0.0	1.3	23.5	21.1	0.0	21.9
5,000 - 7,499	0.6	40.0	2.0	9.8	10.5	33.3	10.9
7,500 - 9,999	0.0	20.0	0.7	0.0	5.3	0.0	1.4
10,000 +	0.0	0.0	0.0	2.0	36.7	66.7	13.7
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Total # of Events in Distribution	145	5	150	51	19	3	73
Events with No Size Estimated	1	0	1	0	6	7	13
Total Events Scheduled	146	5	151	51	25	10	86
Percent by Type	61.6	2.1	63.7	21.5	10.6	4.2	36.3
							100.0

Source: Tabulated and calculated by Darley/Gobar Associates, Inc. based on Greater Boston Chamber of Commerce 1971 Convention Schedule.

EXHIBIT IV-9

PRO-FORMA EVENT SCHEDULE - TYPICAL ARENA

Event	Number of Event Days
Professional Sports (Basketball & Hockey)	80
Amateur Sports (College, High School, Etc.)*	10
Other Sporting Events (Boxing, Wrestling, Roller Games, Closed Circuit TV, Etc.)	10
Name Entertainment Shows	15-20
Circus, Rodeo, Etc.	15
Ice Shows	15
Pageants, Rallies, Etc.	10
Trade Shows, Exhibits	15
Conventions	10-20
Large Meetings, Religious Crusades, Etc.	10
Local Concerts	5
Graduations	5
Miscellaneous Events	5
Total	205-220
Total with no Professional Hockey	165-180
Total with no Professional Basketball or Hockey	125-140

* Due to pressures on existing facilities for scheduling amateur hockey, this event category could be increased significantly at an arena in the Boston area.

Source: Darley/Gobar Associates, Inc. Based on current event schedules at arenas located in larger cities throughout the country.

EXHIBIT IV-10

ALTERNATIVE EVENT DAY SCHEDULES ASSUMING NEW FACILITY CONSISTS OF ONE LARGER ARENA

Event	Total Available to Both Facilities	Operating Level #1		Operating Level #2		Operating Levels #1 & #2		Operating Level #3	
		Celtics in New Arena		Celtics & NHL in New Arena		Combined Arena and Boston Grdn. Residual Available		Boston Garden Not Operating	
		-A-	-B-	-C-	-D-	-E-	-F-	-G-	-H-
		100	90	120	70	190	10	140	60
Prof. Sports	200								
Amateur Sports	150	5	50-30	5	50-30	55-35	90-115	5	145
Prof. Entertainment	20-30	25	0-5	25	0-5	25-30	--	20	0-10
Circus/Rodeo	30-35	25	5-10	25	5-10	30-35	--	25	5-10
Ice Shows	30-40	30	0-10	30	0-10	30-40	--	30	0-10
Disney, Pageants, etc.	20	15	5	10	10	20	--	15	5
Exhibits, Trade Shows	10	10	--	5	5	10	--	--	10
Conventions	18-28	18	--	8	10	18	0-10	--	18-28
Other Events	50-90	--	25	--	25	25	25-65	--	50-90
Total	528-603	228	175	228	175	403	125-200	235	293-368

Source: Darley/Gobar Associates, Inc.

EXHIBIT IV-11

ALTERNATIVE EVENT DAY SCHEDULES ASSUMING NEW FACILITY

CONSISTS OF TWO ARENA COMPLEX AND BOSTON GARDEN CONTINUES TO OPERATE

Event	Operating Level #1			Operating Level #2			Total (Maximum) Available
	Celtics move to new complex:			Celtics and NHL move to new complex:			
	Large Arena	Small Arena	Boston Garden	Large Arena	Small Arena	Boston Garden	
Professional Sports	-A- 70	-B- 30	-C- 100	-D- 120	-E- 30	-F- 50	-G- 200
Amateur Sports	20	110	20	5	110	35	150
Professional Entertainment	20	5	5	20	5	5	30
Circus/Rodeo	25	10	-	25	10	-	35
Ice Shows	30	-	10	30	-	10	40
Disney, Pageants, etc.	10	5	5	10	5	5	20
Exhibits, Trade Shows	10	-	-	10	-	-	10
Conventions	18	-	-	-	-	18	28
	10 $\xleftrightarrow{\text{combined usage}}$	10		10 $\xleftrightarrow{\text{combined usage}}$	10		
Other Events	<u>10</u>	<u>50</u>	<u>30</u>	<u>-</u>	<u>45</u>	<u>45</u>	<u>90</u>
Total	223	220	170	230	215	168	603

Source: Darley/Gobar Associates, Inc.

EXHIBIT IV-12

ALTERNATIVE EVENT DAY SCHEDULES ASSUMING NEW FACILITY
 CONSISTS OF TWO ARENA COMPLEX AND BOSTON GARDEN NOT IN OPERATION
 Operating Level #3

Event	Large Arena	Small Arena	Residual Available
Professional Sports	140	40	20
Amateur Sports	-	110	40
Professional Entertainment	20	10	-
Circus/Rodeo	20	10	5
Ice Shows	35	-	5
Disney, Pageants, etc.	10	5	5
Exhibits, Trade Shows	-	-	10
Conventions	10 $\xleftarrow{\text{combined usage}}$	10	18
Other Events	<u>-</u>	<u>40</u>	<u>50</u>
Total:	235	225	153

Source: Darley/Gobar Associates, Inc.

CHAPTER V

OPERATING INCOME AND EXPENSE PROJECTIONS

Income

Income to an arena is composed primarily of rentals, concession profits, parking fees, and some long term rentals associated with stadium clubs, etc. Some arenas are operated by management which actively co-promotes events, generating an additional source of revenue. The magnitude of income relates to the schedule of events, attendance, rental rates, concession contracts, and the level of parking fees, etc. There is a wide variation in each of these determinants but the basic expected income for a facility of this type can be determined with reasonable accuracy.

One approach is to project total attendance for each event, average ticket prices for each type event, the terms of rental agreements, and per capita concession and parking expenditure. Another way is to integrate all of these factors to define the arena income per capita attendance for various types of events. The use of single per capita income coefficients for each type of event is useful for studies of this type where several alternative schedules and attendance levels are possible.

For this reason, the income coefficients per capita for each type of event have been defined and summarized in Exhibit V-1. Applying these coefficients to the projected attendance for each of the alternative event schedules considered yields a range of operating income estimates.

Rental income per capita varies for each type of event. To define the probable arena revenue per capita at a new Boston Arena, other facilities throughout the country were analyzed in detail in terms of attendance and

rental income for analogous types of events. Similar analyses of arena income per capita from concession operations were used to define the appropriate relationships that can be expected to prevail in Boston. It was assumed that food and beverage concessions would be operated by an outside concessionaire on the basis of a 33 percent split to the arena. The per capita concession income figures are based on the assumption that alcoholic beverages are to be made generally available throughout the arena and are oriented to a new facility with more efficient concession operations.

Parking income per capita is related to the parking charge per vehicle, the average number of people per car, and the proportion of the total attendance that arrives by private auto. One way to prepare such estimates is to assume a fixed per car charge (usually \$1.00 in large city facilities), an average size party or number of people per car (about three), and an average cost of operating a parking facility (from \$0.12 to \$0.18 per car) for the schedule of events. Such per capita income figures are higher than the ones used in Exhibit V-1 which are based on actual experience at comparable parking facilities elsewhere. Because the Boston market is perhaps somewhat less dependent on the private auto than is typical of other areas, the more conservative estimates are used in the appropriate section.

A more important factor that influences parking revenue potential is the ability of the arena management to exploit the parking demand created by activities at the arenas. Both the North Station and South Station sites are expected to have adequate adjacent parking provided by others, therefore, there will be no parking revenue potential for the arena at these sites.

The Kendall Square site and design configurations assume provision of controlled parking in the following amounts:

Build large arena at Kendall Square 2,300 cars

Build two-arena complex at Kendall Square 3,770 cars

Because of these site-related strictures on the arenas' capacity to exploit parking revenue, the net effect of parking revenue on overall financial feasibility will be considered in Chapter VII dealing with site-related factors.

Attendance is the other major income variable to be considered. It can be expected that were the Celtics to have a better choice of dates, they could realize higher attendance than the 267,000 to 311,000 attained in the past two seasons. Average annual attendance of 350,000 is a conservative estimate. The Bruins would probably sell out at a new arena, creating annual attendance of 570,000.

Average attendance at other events relates to the type of event, the quality of the show, effectiveness of promotion, etc. Exhibit V-2 summarizes average attendance projections per event day for each of the pertinent uses. The attendance projections have been extended by the per capita arena revenue estimates (excluding parking revenue) to produce a per day arena revenue projection for each major type of activity.

Typical arena lease arrangements often provide for flat daily rentals for graduations, exhibits, conventions, trade shows, and the like. In a large arena the flat rental rate should range from \$1,000 to \$1,500 per day. Daily rental charges for a small arena should range from \$400 to \$800. For

these projections, the daily rates used were \$1,000 for the large building and \$500 for the small building for those types of events.

Based on the foregoing assumptions, the projected net arena income from rentals and concessions for each of the event schedule alternatives delineated in Chapter IV is presented in Exhibit V-3. Parking income is not included in these projections.

Expenses

Expenses of operating an arena can be divided into four basic classes. One of these is the expense of setting up and tearing down special facilities for a particular type of event. These costs are typically billed directly to the tenant and result in offsetting income and expense items. For these reasons, the so called "reimbursements" are generally irrelevant in terms of defining the operating surplus (deficit) of a facility of this type.

Another type of operating expense deals with the overhead of maintaining a facility regardless of the schedule of events. Such things as administrative salaries, non-reimbursed utility expenses, regular maintenance, insurance, etc. take on many of the characteristics of a fixed operating expense. Because of the alternative configurations being considered, two different levels of fixed operating expense appropriate to this analysis are presented in Exhibit V-4.

Although the overhead and administrative costs of operating an arena are relatively fixed costs, as discussed above, different scales of operation will require different overhead levels. The actual variable costs of operating an event, however, are typically borne by the tenant.

One additional type of cost is appropriate to some types of operations in

which the arena management co-promotes events. The possibilities for co-promotion in a publicly operated facility are limited. It is questionable public policy for an arena operation to assume an entrepreneurial role. In addition, the nature of a public organization often makes it difficult for them to function in an entrepreneurial role. For this reason, possible co-promotion income and expenses were excluded in these projections.

Fixed operating expenses of an arena are composed of administrative and executive salaries and expenses, building operations, utilities, etc. Labor costs make up the most substantial element. Not included in the projections in Exhibit V-4 are labor expenses for ushers, ticket takers, event clean-up, etc., which are reimbursed by tenants. Similarly, the costs for utilities include only those costs not reimbursed by tenants. Reimbursed expenses could easily add \$100,000 to \$150,000 per year to both revenues and costs, but the net effect is that they tend to offset one another.

Net operating income is operating income less operating expenses. The figures for operating surplus are summarized in Exhibit V-5. In addition to incomes from rent and concessions are office rentals to teams, scoreboard and other advertising income and space rental for private clubs.

EXHIBIT V-1

PER CAPITA INCOME TO ARENA BY TYPE OF EVENT

Event	Income Source:			Total
	Rentals	Concessions	Parking	
Professional Basketball	\$0.44	\$ 0.20	\$ 0.26	\$ 0.90
Professional Hockey: NHL	.35	.19	.26	.80
AHL	.30	.15	.26	.71
Boxing/Wrestling	.60	.26	.26	1.12
Roller Games	.50	.20	.26	.96
CCTV	.40	.33	.26	.99
Track	.50	.14	.23	.87
Professional Entertainment	.55	.10	.26	.91
Circus/Rodeo	.50	.20	.26	.96
Ice Shows	.40	.12	.26	.78
Disney, Pageants, etc.	.46	.16	.26	.88

Source: Darley/Gobar Associates, Inc.

EXHIBIT V-2

ATTENDANCE AND REVENUE PROJECTIONS BY TYPE OF EVENT

Event	Average Attendance per Event		Per Capita Income (Excl. Parking)		Average Income Per Event	
	Large Arena	Small Arena	Large or Small Arena		Large Arena	Small Arena
Professional Basketball	8,500	-	\$0.64		\$ 5,440	\$ -
Professional Hockey: NHL	15,000	-	.54		8,100	-
AHL	10,000	-	.45		4,500	-
Boxing/Wrestling	6,000	4,000	.86		5,160	3,440
Roller Games	3,000	3,000	.70		2,100	2,100
CCTV	4,000	4,000	.73		2,920	2,920
Track	10,000	-	.64		6,400	-
Amateur Sports	Flat daily rental rate plus an average net concession income/event					
Professional Entertainment	7,500	4,500	.65		4,875	2,925
Circus, Rodeo, etc.	7,000	4,500	.70		4,900	3,150
Ice Shows	9,200	5,000	.52		4,784	2,600
Disney, Pageants, etc.	9,000	3,000	.62		5,580	1,860
Exhibits, Trade Shows	Flat daily rental rate				1,000	500
Conventions	Flat daily rental rate				1,000	500
Other Events	Flat daily rental rate				1,000	500

Source: Darley/Gobar Associates, Inc.

EXHIBIT V-3

OPERATING REVENUES

Option: Event	A-1			A-2		A-3		B-1		B-2		B-3	
	With Celtics			New Large Arena:		Boston Garden		With Celtics		Two Arena Complex:			
				With Celtics & NHL		With Celtics	Not Operating	With Celtics		With Celtics & NHL		With Celtics	Not Operating
Prof. Basketball	\$ 217,600			\$ 217,600		\$ 217,600		\$ 217,600		\$ 217,600		\$ 217,600	
Prof. Hockey: NHL	---			307,800		307,800		---		307,800		307,800	
AHL	---			---		180,000		---		---		180,000	
Boxing/Wrestling	154,800			103,200		51,600		129,000		206,400		146,200	
Roller Games	42,000			31,500		10,500		42,000		42,000		31,500	
CCTV	29,200			14,600		14,600		29,200		14,600		29,200	
Track	12,800			12,800		12,800		12,800		12,800		---	
Amateur Sports	4,200			4,200		4,200		98,350		77,350		73,150	
Prof. Entertainment	121,875			121,875		97,500		112,125		112,125		126,750	
Circus, Rodeo, etc.	122,500			122,500		122,500		154,000		154,000		129,500	
Ice Shows	143,520			143,520		143,520		143,520		143,520		167,440	
Disney, Pageants, etc.	83,700			55,800		83,700		65,100		65,100		65,100	
Exhibits, Trade Shows	10,000			5,000		---		10,000		10,000		---	
Conventions	18,000			8,000		---		33,000		15,000		15,000	
Other Events	---			---		---		35,000		22,500		20,000	
Total	\$ 960,195			\$ 1,148,395		\$ 1,246,320		\$ 1,081,695		\$ 1,400,795		\$ 1,509,240	

Source: Darley/Gobar Associates, Inc.

EXHIBIT V-4

NON-REIMBURSED ANNUAL OPERATING EXPENSE PROJECTIONS

Item	Large Arena	Combined Facility
Administrative Salaries & Payroll Taxes	\$ 62,000	\$ 70,000
Office Salaries	18,000	18,000
Taxes and License	1,000	1,000
Telephone & Telegraph	4,000	4,500
Office Supplies	2,000	2,500
Legal & Audit	4,000	4,000
Dues & Subscriptions	1,000	1,000
Insurance	30,000	30,000
Travel & Entertainment	6,000	6,000
Building Operation Labor Costs	160,000	200,000
Utilities ¹	40,000	50,000
Materials, Supplies, & Repairs	65,000	80,000
Contingency	50,000	60,000
Total	\$443,000 ²	\$527,000 ²

¹ Excludes utilities costs reimbursed by tenant.

² Excludes provision for continuing program of capital improvements of \$50,000 for a large arena, and as much as \$100,000 per year for a major complex of two arenas, joining arcades, etc.

Source: Darley/Gobar Associates, Inc.

EXHIBIT V-5

DEBT SERVICE CAPACITY FROM ARENA OPERATING SURPLUS

	Operating Income	Other Net Income (Rents)	Total Net Income	Operating Expenses	Operating Surplus	Debt Service Capacity
A. New Large Arena						
Operating Level #1	\$ 960,195	\$20,000	\$ 980,195	\$443,000	\$ 537,195	\$ 9.2 mil.
Operating Level #2	1,148,395	30,000	1,178,395	443,000	735,395	12.6 mil.
Operating Level #3	1,246,320	30,000	1,276,320	443,000	833,320	14.3 mil.
B. Two Arena Complex						
Operating Level #1	1,081,695	20,000	1,101,695	527,000	574,695	10.0 mil.
Operating Level #2	1,400,795	30,000	1,430,795	527,000	903,795	15.6 mil.
Operating Level #3	1,509,240	30,000	1,539,240	527,000	1,012,240	17.5 mil.

Source: Darley/Gobar Associates, Inc.

CHAPTER VI

ARCHITECTURAL ANALYSIS

INTRODUCTION

The purpose of this chapter is to establish criteria for program, site, budget and time considerations only. No attempt has been made to develop a design solution for the various types of structures programmed or recommend a site solution for the sites considered.

The Boston Arena Authority, together with the economic consultant, have determined that there is a need to consider the following:

1. A multi-purpose arena with a seating capacity of 12,000 permanent and 3,000 temporary seats for general use. (large arena)
2. A dual-arena facility combining the large arena with a multi-purpose arena with a seating capacity of 6,000 permanent and 2,000 temporary seats
3. Meeting room, dining and exhibition space to accommodate 3,000. (convention facilities)
4. A practice/competition track with seating for 1,000. The primary use is intended for secondary school participants. (practice track)

Four sites have been selected by the Boston Arena Authority for consideration. These are: Existing Boston Arena, South Station, North Station and Kendall Square. The existing Boston Arena site is too small to accommodate either a large or dual-arena facilities and therefore has been eliminated from the analysis. At each of the remaining sites, various alternatives are proposed.

1. Construct the large arena at South Station, North Station or Kendall Square. It is our recommendation that the convention facilities be related to this facility.
2. Construct the large arena and a small arena at South Station, North Station or Kendall Square. It is our recommendation that the practice track to be related to this facility.

NOTE: Several of these alternatives may require additional land. However, for evaluation, we have prepared cost estimates on the assumption that additional land can be obtained except at the existing Boston Arena site which is hopelessly inadequate for a large Arena and required parking.

PROGRAM ANALYSIS

The Programs of Requirements listed below are based on economic data contained in other chapters of this report, functional requirements and comparable facilities in other cities. Parking requirements are based on type of arrivals; existing spaces available; and a ratio of 3.5 persons per car for all automobile arrivals. (See Exhibit VI-1)

EXHIBIT VI-1

TYPE OF ARRIVAL TABULATION

Site	TYPE OF ARRIVAL				Recommended No. of Parking Spaces to be provided
	Maximum Attendance Planned	Public Trans- portation	Auto- mobile	Parking Available Within One-Fourth Mile Radius	
South Station	15,000	7,500	7,500	7,497 ¹ & 2	0
	23,000	11,500	11,500	7,497 ¹ & 2	0
North Station	15,000	7,500	7,500	4,761 ¹ & 3	0
	23,000	11,500	11,500	4,761 ¹ & 3	0
Kendall Square	15,000	5,250	9,750	500	2,300
	23,000	8,050	14,950	500	3,770

¹ Information obtained from Off-Street Parking Inventory 1968/1969 Transportation Facts
Boston Redevelopment Authority.

² Includes 5,000 parking spaces planned for site.

³ Includes Government Center Garage, and new 1,000 car garage planned for site.

PROGRAMMED EVENTS

Ice Hockey

Basketball

Track

Boxing and Wrestling

Tennis

Gymnastics

Concerts

Rodeos

Circuses

Ice Shows

Public and Religious Meetings

Conventions

Trade Shows and Exhibitions

Roller Derby

Public Ice and Roller Skating

Entertainment Spectaculars

Animal Shows

SPECTATOR SUPPORT FACILITIES

Upholstered armchair seats- 15,000 (includes 3,000 temporary seats)

Public toilets and concourses

Ramps, stairs, escalators and elevators

Ticket booths (8)

First Aid Room

Lost and found

Security room

CONCESSION FACILITIES

Arena Club* (500 capacity)

Public stands*

Vendor stations*

Commissary*

OFFICE FACILITIES

Ticket (4,000 square feet)

Management (6,000 square feet)

Tenant (10,000 square feet)

CONVENTION FACILITIES

Exhibition area(35,000 square feet includes arena floor)

Meeting rooms for 3,000

Holding kitchen*

DRESSING FACILITIES

Team-6 (capacity 20 each)

Employee-2 (capacity 15 each)

Concession-4 (capacity 30 each)

Star-10

PRESS FACILITIES

Working press--50

T.V.-1 booth

Radio-3 booths

Teletype room (10 stations)

Toilets

Interview room

Lounge (capacity 75)

*Lessee provided equipment not in estimate.

MAINTENANCE FACILITIES

Storage (25,000 square feet)

Seat

Equipment

General

Shop (5,000 square feet)

Freight elevator

Sound system and equipment room

Loading dock

Mechanical, electrical, telephone and janitor's areas

EQUIPMENT

Includes signs, turnstiles, trash handling facilities, basketball floor and goals, clocks, goal lights, pads, hockey dasher and nets, zamboni, benches, insulated floor, boxing ring, stairs, bell, portable stage, spotlights, blackout draperies, indoor track, dash track, pits, scoreboard, outside attraction board, etc.

SITE FACILITIES

Landscaped entrances and pedestrian areas

Bus, taxi, and automobile approaches.

Staging and services areas

Automobile parking

South Station 0

North Station 0

Kendall Square 2,300

PROGRAM OF REQUIREMENTS LARGE AND SMALL ARENAS COMBINED

PROGRAMMED EVENTS

Ice Hockey
Basketball
Track
Boxing and Wrestling
Tennis
Gymnastics
Concerts
Rodeos
Circuses
Ice Shows
Public and Religious Meetings
Conventions
Trade Shows and Exhibitions
Roller Derby
Public Ice and Roller Skating
Entertainment Spectaculars
Animal Shows

SPECTATOR SUPPORT FACILITIES

Upholstered armchair seats-15,000 (includes 3,000 temporary seats)
Armchair seats -8,000 (includes 2,000 temporary seats)
Public toilets and concourses
Ramps, stairs, escalators and elevators
Ticket booths (10)
First Air Room
Lost and found
Security room

CONCESSION FACILITIES

Area Club* (500 capacity)

Public stands*

Vendor stations*

Commissary*

OFFICE FACILITIES

Tickets (5,000 square feet)

Management (8,000 square feet)

Tenant (10,000 square feet)

CONVENTION FACILITIES

Exhibition area (50,000 square feet includes both arena floors)

Meeting rooms for 3,000

Holding kitchen*

PRACTICE TRACK FACILITIES

Seating for 1,000

Complete track equipment

DRESSING FACILITIES

Team-12 (capacity 20 each)

Employee-2 (capacity 30 each)

Concession -4 (capacity 45 each)

Star-10

PRESS FACILITIES

Working press-80

T. V. -2 booths

Radio- 5 booths

Teletype room (10 stations)

*lessee provided equipment not in estimate.

Toilets

Interview rooms -2

Lounge (capacity 100)

MAINTENANCE FACILITIES

Storage (38,000 square feet)

Seat

Equipment

General

Shop (7,000 square feet)

Freight elevators -2

Sound systems and equipment rooms

Loading dock

Mechanical, electrical, telephone and janitor's areas

EQUIPMENT

Includes signs, turnstiles, trash handling facilities, basketball floors and goals, clocks, goal lights, pads, hockey dashers and nets, zamboni, benches, insulated floors, boxing ring, stairs, bell, portable stage, spotlights, blackout draperies, indoor track, dash track, pits, scoreboards, outside attraction boards, etc.

SITE FACILITIES

Landscaped entrances and pedestrian areas

Bus, taxi and automobile approaches

Staging and service areas

Automobile parking

South Station 0

North Station 0

Kendall Square 3,770

SITE ANALYSIS

The scope of this section is to conclude if the programmed facility could be built on the sites in question. In reviewing the sites selected by the Boston Arena Authority, the following criteria are examined:

1. Area and configuration
2. Subsurface conditions
3. Topography
4. Access and egress

The approximate area required for this particular type building is:

1. Large arena -4.0 acres
2. Large and small
arena combined -7.5 acres

On the sites which can accommodate surface parking, a figure of 110 cars per acre is used.

Subsurface soil conditions were obtained from the Journal of the Boston Society of Civil Engineers. It appears that pile or caisson foundations are required on each of the sites evaluated. A thorough sub-surface investigation should be made prior to final site selection.

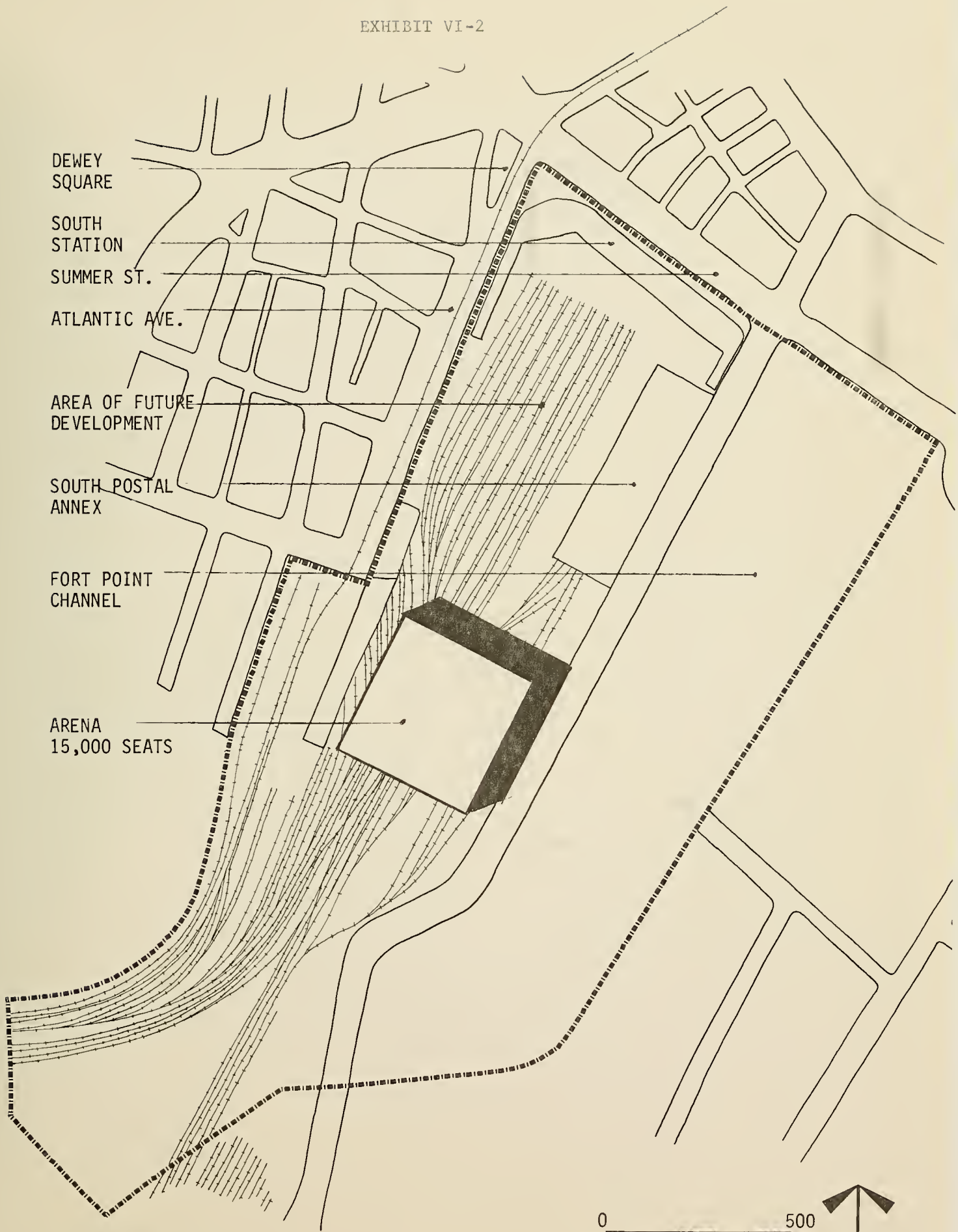
Access and egress for the sites are evaluated on existing surface streets, parking facilities, limited access highways, street car routes, bus routes and rapid transit lines and stops in the area of the site. Considerations has been given to the number of possible transfers that potentially would have to be made by people arriving by way of the rapid transit system in determining the percentage of arrivals.

Planning implications are based on discussions with the Boston Redevelopment Authority, Metropolitan District Commission and the Cambridge Redevelopment Authority and the planned land use for each of the sites evaluated. This is an important consideration and careful study should be given to the impact created by facilities of this type upon the proposed and/or existing land use of the area.

SOUTH STATION

The area available for the arena facility is approximately 64 acres which has a configuration as indicated in Exhibits VI-2 and VI-3. The amount of land available is sufficient. At this site, it is envisioned that the arena floor may be raised above the existing grade to allow for continued use of the tracks as well as to allow for service considerations. This obviously increases construction costs. If the practice track is to be included in this development, it is felt that it would be advantageous to integrate it into the arena complex by raising the arena floor to allow for this facility at the lower level. The subsurface conditions consist of a layer of overburden composed of fill, silt, sand, blue clay and gravel. Though the approximate depth of hard rock capable of supporting cussions is between 100 and 120 feet, the topography of this site is basically flat which is satisfactory for this type of facility.

Access and egress for the site are adequate for automobile movement. Assuming that the proposed 5,000 parking spaces are constructed at this site as planned (see Exhibit VI-1), adequate parking facilities are available. If the parking within this proposed development is not completed prior to the arena completion, the lack of parking would cause problems only if the large and small arenas were both placed on this site.



SOUTH STATION

DEWEY
SQUARE

SOUTH
STATION
SUMMER ST.

ATLANTIC AVE.

AREA OF FUTURE
DEVELOPMENT

SOUTH POSTAL
ANNEX

ARENA
8,000 SEATS

FORT POINT
CHANNEL

ARENA
15,000 SEATS

SOUTH STATION

0

500

SCALE

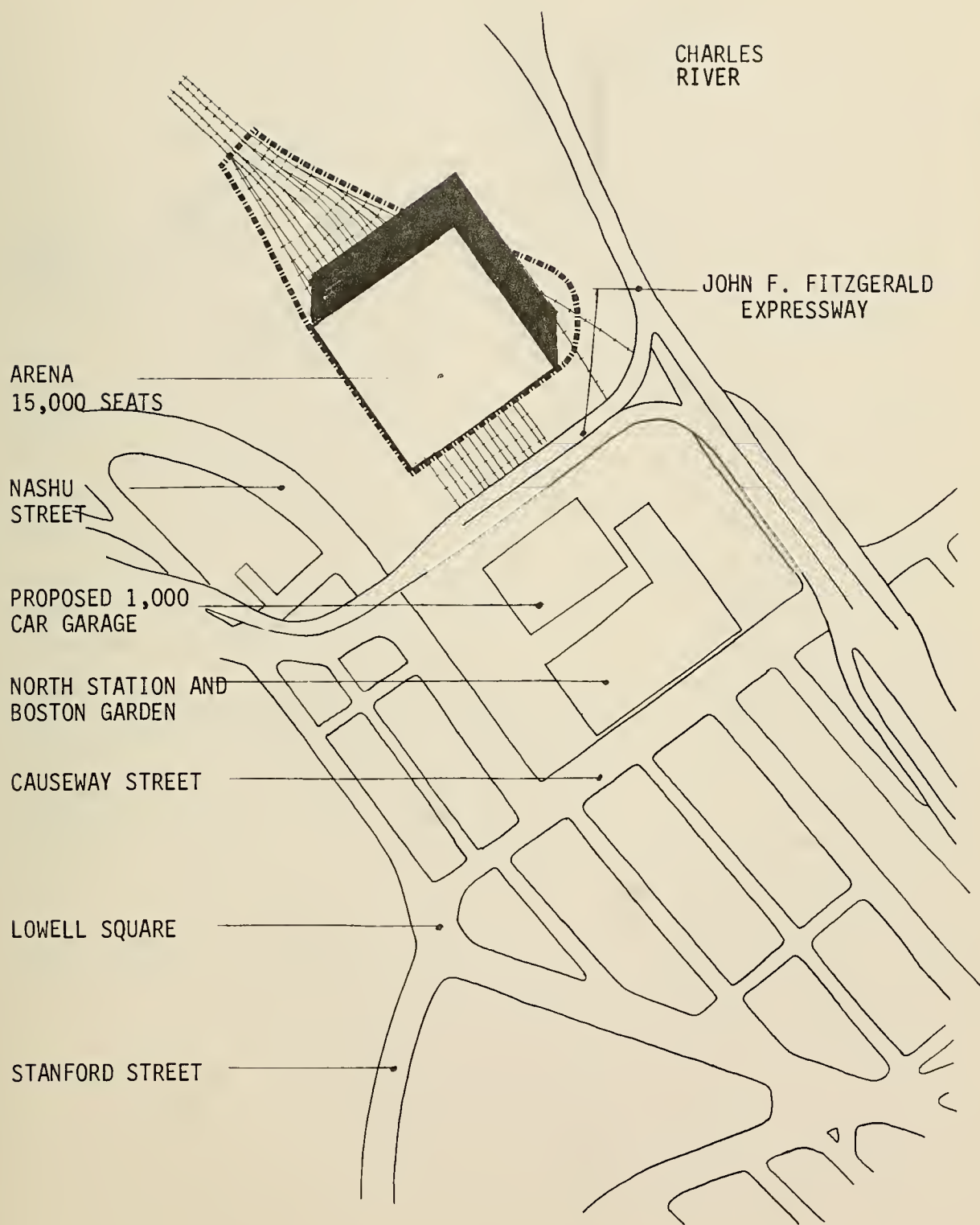


This station is served by one rapid transit line (red). Access to two other lines (orange and green) can be accomplished by one transfer. Access to the remaining line would require two transfers. It is anticipated that 50% of the people will arrive by transit. This site can also be served by a commuter boat line and New York-Boston High Speed rail system.

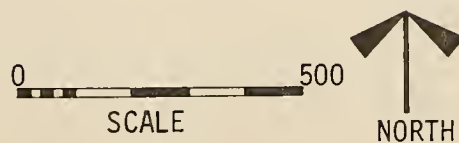
The development of the site as envisioned by Boston Redevelopment Authority includes a complex of parking, hotels, shops, a transportation center and office buildings. Considering the envisioned planned land use of the site, it is felt that the arena is compatible with the complex and can be incorporated into the development.

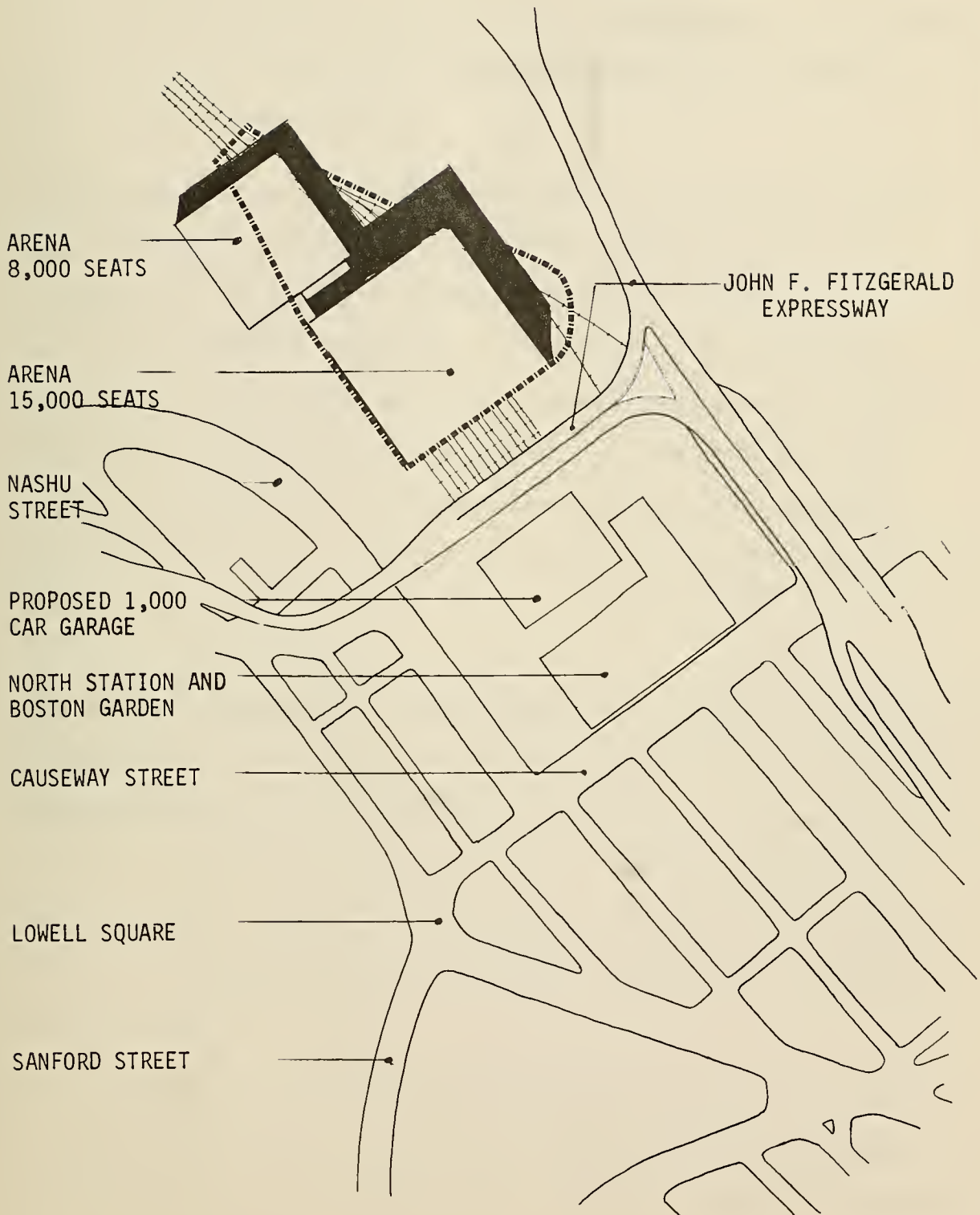
NORTH STATION

The areas available for the arena facility is approximately six (6) acres which has a configuration as indicated in Exhibits VI-4 and VI-5. The amount of land available is sufficient for a large arena, however, additional land must be acquired for the construction of a combination large and small arena. At this site, it is envisioned that the arena floor may be raised above the existing grade to allow for continued use of the tracks as well as to allow for service considerations. This will result in higher construction costs. If the practice track is to be included in this development, it is felt that it would be advantageous to integrate it into the arena complex by raising the arena floor to allow for this facility at the lower level. The subsurface conditions consist of a layer of overburden composed of fill, silt and sand. The approximate depth of hard rock capable of supporting caissons is between 60 and 70 feet. The topography of the site is basically flat which is satisfactory for this type of facility.



NORTH STATION





NORTH STATION



Major traffic arteries in the area are sufficient to handle the number of cars anticipated but it appears that some improvements will be necessary. If this site is selected, traffic studies should be made to determine what improvements are required.

Assuming that the proposed 1,000 parking spaces are constructed at this site as planned (see Exhibit VI-1), adequate parking facilities are available to serve a large or combination large and small arena.

It should be noted that Exhibit VI-1 does not take into consideration simultaneous use of a combination large and small arena and the existing Boston Garden facility above North Station. If this occurred, there would be a shortage of parking spaces and possible traffic congestion. Adequate facilities can be incorporated to handle the arrivals by taxi and bus.

This station is served by two rapid transit lines (orange and green). It is anticipated that 50% of the people will arrive by transit. Access to the other two lines (blue and red) can be accomplished by one transfer. The site is served by four commuter lines serving the northern suburbs. Another possible advantage of North Station is that it has established itself as the location in the city for indoor sports with the presence of the Boston Garden.

The 1,000 car parking facility mentioned above is planned to be erected northwest of the station between the station and the elevated roadway.

The Arena (s), as shown in Exhibits VI-4 and VI-5 is envisioned northwest of

the elevated roadway. This situation creates a somewhat difficult and long walk for pedestrians in North Station to actually get into the structure since they must bypass the proposed new parking facility and cross under the elevated roadway before entering. To provide an adequate solution for satisfactory pedestrian circulation increases site development costs.

KENDALL SQUARE

The area available for the arena facility is approximately 24 acres which has a configuration as indicated in Exhibits VI-6 and VI-7. The amount of land available is sufficient. At this site, it is envisioned that the arena floor be on or below existing grade level which offers construction savings.

If the practice track is to be included in the development, it is felt that it would be advantageous to integrate it into the arena complex by raising the floor to allow for this facility at the lower level. The subsurface conditions consist of a layer of overburden composed of soft to medium blue clay with bedrock at 100 foot depth. The topograph of this site is basically flat and satisfactory for this type of facility.

The only transit line serving the site is the red line. Since this site is out from the CBD of Cambridge and the transit stop is several long blocks from the proposed location, it is felt that the number of arrivals by the transit system would be approximately 35%.

As noted in Exhibit VI-1, the number of parking spaces required at this site would create a situation that would require the entire site to be covered with parking except for that portion where the arenas are located. This is further complicated by the lack of existing surface streets to handle this capacity of cars, even at off-peak hours. If this site is

EXHIBIT VI-6



BINNEY

/DOT

BROADWAY

- PARKING

ARENA
15,000
SEATS

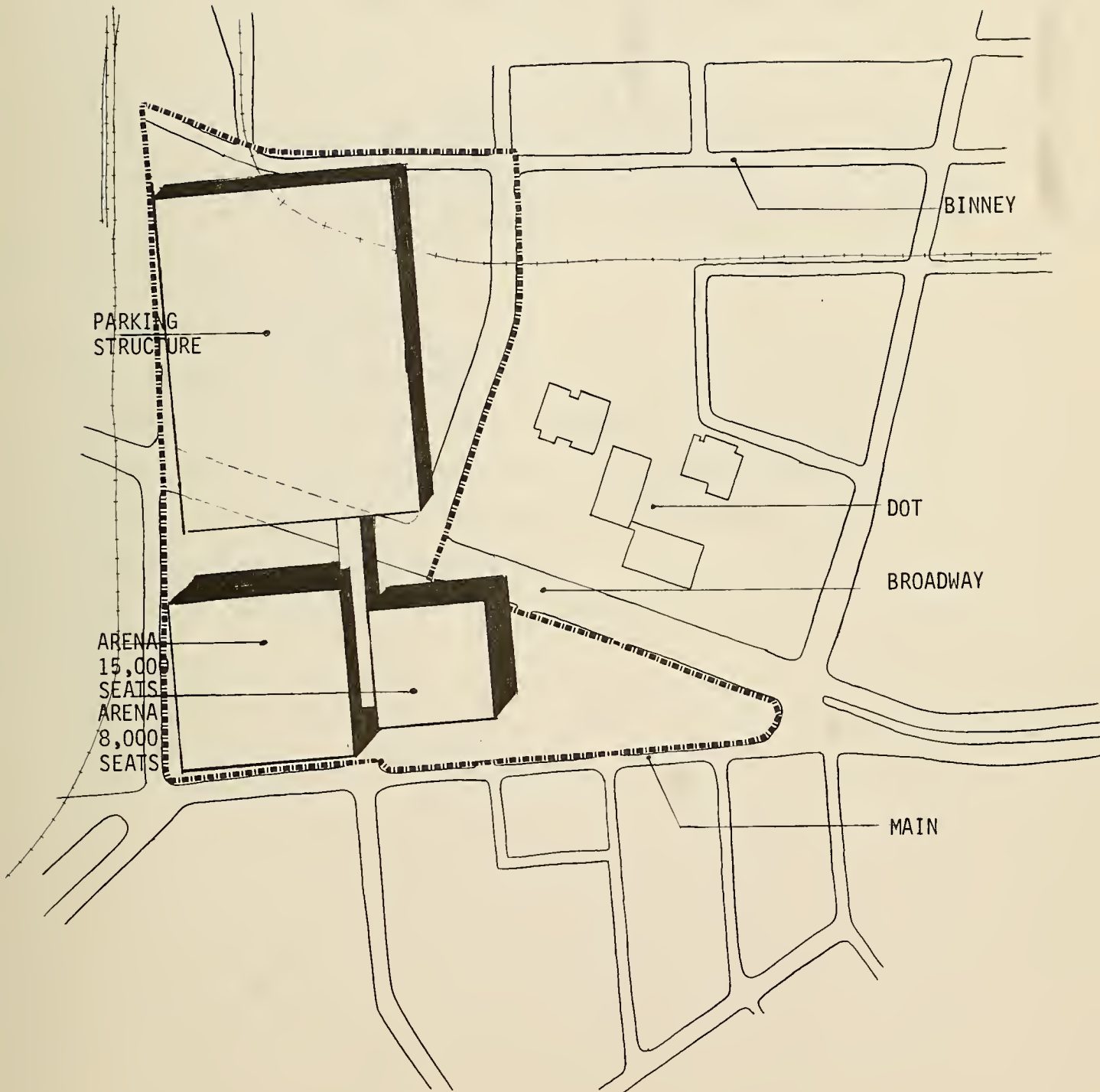
MAIN

0 500

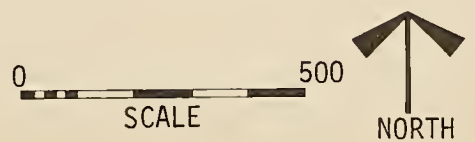
SCALE



NORTH



KENDALL SQUARE



selected, study should be given to a rapid busway system to serve the facility, with a limited number of parking spaces at the site or improvements made to the existing street network. For estimate purposes, we have assumed the latter.

Land use projections by the Cambridge Redevelopment Authority invasion research office and housing development in this area. An arena may not be compatible with this type of development and the impact created could be detrimental.

EXISTING BOSTON ARENA SITE

The area of this site is approximately 2 acres. This is sufficient for remodeling the existing arena or constructing a small arena at this site, only if additional adjacent land is acquired for parking. It is not large enough for the erection of a large arena or the combination of large and small arenas.

TIME SCHEDULES

The time schedules listed below are normal or non-accelerated. By utilizing project acceleration techniques, these times could be reduced. All schedules are based on a single responsibility construction contract. Time is computed in weeks.

	Weeks Each Phase	Total Time Elapsed
Large Arena (All sites)		
Schematic Design Phase	8	8
Client's Review and Approval	1	9
Design Development Phase	10	19
Client's Review and Approval	2	21
Contract Documents Phase	28	49
Client's Review and Approval	2	51
Contract Documents Reproduced, Bound and Shipped	1	52
Bidding Phase	8	60
Bids Reviewed and Contract Awarded	2	62
Construction Phase	85	147

	Weeks Each Phase	Total Time Elapsed
Large and Small Arenas Combined (All Sites)		
Schematic Design Phase	9	9
Client's Review and Approval	2	11
Design Development Phase	12	23
Client's Review and Approval	2	25
Contract Documents Phase	31	56
Client's Review and Approval	3	59
Contract Documents Reproduced, Bound and Shipped	2	61
Bidding Phase	8	69
Bids Reviewed and Contract Awarded	3	72
Construction Phase	100	172

ESTIMATES

The estimates are based on the applicable Program of Requirements, a cleared site, the award of a single responsibility general contract and the December 1971 ENR (Engineering News Record) Building Cost Index for the Boston area which is 1012. Any projection for costs beyond this date should be updated to the award of the contract. Not included are allowances for any off-site construction, utility extensions or enlargement, lessee furnished equipment or land costs as applicable.

These are conservative programming estimates, based on functional requirements, building systems and site conditions. It is necessary to develop Schematic Phase Documents for a specified solution before a final project cost can be determined.

LARGE ARENA - SOUTH STATION

Arena and convention facilities	\$ 18,100,000.00
Site development	350,000.00
Equipment	800,000.00
Total Construction Costs	\$ 19,250,000.00

Add for practice track facilities \$ 1,500,000.00

Adjusted total construction cost \$20,750,000.00

Allowances

Surveys, testing, resident representative, repro- duction, travel, archi- tectural, engineering and consultants fees, etc.	\$ 1,730,000.00
In-progress contingency	\$ 770,000.00

TOTAL PROJECT COSTS (excluding land) \$ 21,750,000.00

Add for practice track facilities \$ 1,695,000.00

Total adjusted project cost (excluding
land) \$23,445,000.00

LARGE ARENA - NORTH STATION

Arena and convention facilities	\$ 18,150,000.00
Site development	550,000.00
Equipment	800,000.00
Total Construction Costs	\$ 19,500,000.00

Add for practice track facilities \$ 1,500,000.00

Adjusted total construction cost \$21,000,000.00

Allowances

Surveys, testing, resident
representative, repro-
duction, travel, archi-
tectural, engineering and
consultants fees, etc.

\$ 1,755,000.00

In-progress contingency

\$ 780,000.00

TOTAL PROJECT COSTS (excluding land) \$ 22,035,000.00

Add for practice track facilities \$ 1,695,000.00

Total adjusted project cost (excluding

land)

\$23,730,000.00

LARGE ARENA - KENDALL SQUARE

Arena and convention facilities	\$ 17,850,000.00
Site development (includes surface parking for 2,300 cars)	2,444,600.00
Equipment	800,000.00

Total Construction Costs	\$ 21,094,600.00
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Add for practice track facilities	\$ 1,500,000.00
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Adjusted total construction cost	<u>\$22,594,600.00</u>
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Allowances

Surveys, testing, resident representative, repro- duction, travel, archi- tectural, engineering and construction fees, etc.	\$ 1,898,500.00
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In-progress contingency	\$ 843,800.00
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TOTAL PROJECT COSTS (excluding land)	<u>\$ 23,836,900.00</u>
--------------------------------------	-------------------------

Add for practice track facilities	\$ 1,695,000.00
-----------------------------------	-----------------

Total adjusted project cost (excluding land)	<u>\$25,531,900.00</u>
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LARGE AND SMALL ARENAS COMBINED - SOUTH STATION

Arenas with convention and practice

track facilities	\$26,500,000.00
Site development	450,000.00
Equipment	1,200,000.00
Total Construction Costs	\$28,150,000.00

Deduct for practice track

facilities	\$ 1,500,000.00
------------	-----------------

Adjusted total construction

costs	<u>\$26,650,000.00</u>
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Allowances

Surveys, testing, resident

representative, repro-

duction, travel, archi-

tectural, engineering

and consultants fees, etc.	\$ 2,252,000.00
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In-progress contingency	\$ 844,500.00
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TOTAL PROJECT COSTS (excluding land)	\$31,246,500.00
--------------------------------------	-----------------

Deduct for practice track

facilities	\$ 1,665,000.00
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Adjusted total project costs (exclud-

ing land)	<u>\$29,581,500.00</u>
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LARGE AND SMALL ARENAS COMBINED - NORTH STATION

Arenas with convention and practice

track facilities	\$ 26,650,000.00
------------------	------------------

Site development	750,000.00
------------------	------------

Equipment	1,200,000.00
-----------	--------------

Total Construction Costs	\$ 28,600,000.00
--------------------------	------------------

Deduct for practice track

facilities	\$ 1,500,000.00
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Adjusted total construction

costs	<u>\$27,100,000.00</u>
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Allowances

Surveys, testing, resident

representative, repro-

duction, travel, archi-

tectural, engineering

and consultants fees, etc.	\$ 2,288,000.00
----------------------------	-----------------

In-progress contingency	\$ 858,000.00
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TOTAL PROJECT COSTS (excluding land)	\$ 31,746,000.00
--------------------------------------	------------------

Deduct for practice track

facilities	\$ 1,665,000.00
------------	-----------------

Total adjusted project costs

(excluding land)	<u>\$30,081,000.00</u>
------------------	------------------------

LARGE AND SMALL ARENAS COMBINED - KENDALL SQUARE

Arenas with convention and practice	
track facilities	\$ 25,150,000.00
Site development (including	
parking structure for 3,770 cars)	10,801,200.00
Equipment	1,200,000.00
Total Construction Costs	\$ 37,151,200.00
Deduct for practice track	
facilities	\$ 1,500,000.00
Adjusted total construction costs	<u>\$35,651,200.00</u>
Allowances	
Surveys, testing, resident	
representative, repro-	
duction, travel, archi-	
tectural, engineering and	
consultants fees, etc.	\$ 2,972,000.00
In-progress contingency	\$ 1,114,500.00
TOTAL PROJECT COSTS (excluding land)	<u>\$ 41,237,700.00</u>
Deduct for practice track	
facilities	\$ 1,665,000.00
Total adjusted project costs (exclud-	
ing land)	<u>\$39,572,700.00</u>

CHAPTER VII
SITE CONSIDERATIONS AND
INVESTMENT IMPLICATIONS

The consultants were asked to consider four sites and several possible facility configurations for each site. Since the current site of the Boston Arena is physically inadequate to accommodate the arena the analysis is concerned with only three sites. Construction costs, excluding land costs for each of the pertinent options, are summarized in Chapter VI.

The highest costs of construction are at Kendall Square. The lowest costs of construction are at the South Station site. Potential parking revenues at the Kendall Square site more than offset the higher construction cost for the large arena only. However, on the basis solely of construction cost for the two arena complex, the only factor that would permit sustained interest in the Kendall Square site is the possibility of acquiring the land much more favorably than it could be acquired at the North Station or South Station sites. In all cases, the potential net cash flow from operations will be inadequate to cover the full debt service of any of the facility options and locations being considered.

Conversion of an income flow to its debt support capacity requires the consultant to make some assumption concerning the probable interest rate prevalent in the market at the time the bonds will be sold. If current municipal bond rate patterns prevail, the probable applicable interest rate on whatever municipal debt is issued to finance construction will be in a 4.5 to 5.5 percent range. The debt constant for a 5.0 percent 40 year obligation is 5.828 percent per year, i.e. a constant annual payment at

that rate will cover interest and amortization on a 40 year, 5 percent bond. The actual cash flows required to service the debt could, however, be different from the level constant, even if interest rates do not change significantly. The bond indenture could call for interest only payments in the initial years. Use of serial bond issues could also alter the timing and amount of debt service payments. Most likely, actual interest payments will be made on a quarterly basis instead of annually as is assumed by the 5.828 percent debt constant. Except for major changes in interest rates, however, most of the factors noted will have only a minor effect on the actual cash flow requirement.

The variables in the costs of providing the facility include the different costs associated with the facility options being considered and the differential costs of construction resulting from site differences. Construction costs for the 12 different combinations of facility and site that are physically feasible are summarized in Exhibit VII-1. Half of the alternative design configurations for which construction cost estimates were developed relate to the option of providing a permanent indoor track for schoolboy practice. Consideration of the cost of such a facility is related to availability of \$3.5 million to finance a track of this type. If, by including the track, the Arena Authority is able to mobilize this capital fund, the net amount of unserviced capital investment can be reduced. The net construction cost of adding a permanent schoolboy track in the large arena configuration is \$1.695 million. In the two-arena complex the cost differential is about \$1.66 million. In each case, if providing a track would facilitate an additional input of \$3.5 million, a part of the capital contribution would be applicable to the costs of constructing the facilities. The net capital effects are described in Exhibit VII-2.

The sources of capital available to cover the construction costs defined in Exhibit VII-1 include net operating income capitalized at 5 percent (a 5.828 debt constant for 40 year amortization) which will support the levels of debt indicated for each of the combinations of facility and operating conditions noted (Exhibit VII-3). Another potential source of debt support is parking revenue generated from arena-controlled parking at the Kendall Square site. This source of investment support is inapplicable at the North Station and South Station sites where parking will be controlled by others (Exhibit VII-4). The other potential source of capital contribution is the \$3.5 million allocation to provide an indoor schoolboy track in Boston.

The array of these variables in Exhibits VII-5 and 6 provides a simplified integration of the net effect on total unsubsidized construction costs of various combinations of operating policy, facility capacity, and site.

EXHIBIT VII-1

CONSTRUCTION COST ESTIMATES FOR ALTERNATIVE LOCATIONS AND FACILITY OPTIONS

	Site #1 Kendall Square	Site #2 North Station	Site #3 South Station
Large Arena (15,000 permanent seats)			
with permanent track	\$25,531,900	\$23,750,000	\$23,445,000
without permanent track	\$23,836,900	\$22,035,000	\$21,750,000
(Cost of track \$1,695,000)			
Combined Facility (large & small arenas)			
with permanent track	\$41,237,700	\$31,746,000	\$31,246,500
without permanent track	\$39,572,700	\$30,081,000	\$29,581,500
(Cost of track \$1,665,000)			

Note: All land costs are excluded.

Source: Finch-Heery, See Chapter VI

EXHIBIT VII-2

POTENTIAL EXTRA CAPITAL CONTRIBUTION
FOR PROVIDING A SCHOOLBOY TRACK FACILITY

	Large Arena	Two Arena Complex
	(Millions of Dollars)	
Additional construction capital for a track	\$3.500	\$3.500
Additional construction cost for a track	1.695	1.665
Net additional capital available	\$1.805	\$1.835

Source: Darley/Gobar Associates, Inc.

EXHIBIT VII-3

NET EFFECTS OF EXPANDED SCHEDULES
RELATED TO COMPETITIVE POLICY OF BOSTON GARDEN

	Large Arena		Two Arena Complex	
	Amount	Increment	Amount	Increment
Capital Investment Supported by Net Operating Income:				
Operating Level #1	\$ 9.2 mil.		\$10.0 mil.	
Operating Level #2	12.6 mil.	\$ 3.4 mil.	15.6 mil.	\$ 5.6 mil.
Operating Level #3	14.3 mil.	1.7 mil.	17.5 mil.	1.9 mil.

Source: Darley/Gobar Associates, Inc.

EXHIBIT VII-4

PARKING REVENUE AT VARIOUS SITE OPTIONS

Option	Total Available Parking Spaces	Annual Revenue	Implicit Debt Support Capacity
A. Large Arena Only	2,300		
1. Celtics move to new arena		\$255,372	\$4.38 mil.
2. Celtics and NHL move to new arena		298,623	5.12 mil.
3. Boston Garden not operating		348,387	5.98 mil.
B. Two Arena Complex	3,770		
1. Celtics move to new arena		270,124	4.63 mil.
2. Celtics and NHL move to new arena		387,222	6.64 mil.
3. Boston Garden not operating		445,478	7.64 mil.

Source: Darley/Gobar Associates, Inc.

EXHIBIT VII-5

NET UNSUPPORTED DEBT UNDER ALTERNATIVE CONDITIONS OF LOCATION
AND OPERATION FOR A LARGE ARENA

(All Figures in Millions of Dollars)

Operating Level:*	Site #1 - Kendall Square		Site #2 - North Station		Site #3 - South Station	
	Level #1	Level #2	Level #1	Level #2	Level #1	Level #2
Construction Cost (Excluding land and practice track)	\$23.84	\$23.84	\$22.04	\$22.04	\$21.75	\$21.75
Debt Support from Operating Surplus	9.20	12.60	9.20	12.60	9.20	12.60
Net Unsupported Debt	\$14.64	\$11.24	\$12.84	\$ 9.44	\$12.55	\$ 9.15
Potential Debt Support from Parking Revenue	4.38	5.12	N.A.**			
Net Unsupported Debt	\$10.26	\$ 6.12				
Potential Net Capital Contribution for Schoolboy Track	1.81	1.81	1.81	1.81	1.81	1.81
Net Unsupported Debt	\$ 8.45	\$ 4.31	\$11.03	\$ 7.63	\$10.74	\$ 7.34

* Level #1 - Celtics move to new arena (no hockey); Level #2 - Celtics and NHL move to new arena; Level #3 - Boston Garden not operating.

** Note that operation of a large arena at the North Station or South Station sites creates parking revenue of \$275,000 to \$420,000 per year for operation of adjacent facilities. Capitalized at 5.828 percent, this income represents an asset value of \$4.7 to \$7.2 million.

Source: Darley/Gobar Associates, Inc.

EXHIBIT VII-6

NET UNSUPPORTED DEBT UNDER ALTERNATIVE CONDITIONS OF LOCATION
AND OPERATION FOR A TWO ARENA COMPLEX
(All Figures in Millions of Dollars)

Operating Level:*	Site #1 - Kendall Square			Site #2 - North Station			Site #3 - South Station		
	Level #1	Level #2	Level #3	Level #1	Level #2	Level #3	Level #1	Level #2	Level #3
Construction Cost (Excluding land and practice track)									
	\$39.57	\$39.57	\$39.57	\$30.08	\$30.08	\$30.08	\$29.58	\$29.58	\$29.58
Debt Support from Operating Surplus	10.00	15.60	17.50	10.00	15.60	17.50	10.00	15.60	17.50
Net Unsupported Debt	\$29.57	\$23.97	\$22.07	\$20.08	\$14.48	\$12.58	\$19.58	\$13.98	\$12.08
Potential Debt Support from Parking Revenue	4.63	6.64	7.64	N.A.**					
Net Unsupported Debt	\$24.94	\$17.33	\$14.43						
Potential Net Capital Contribution for Schoolboy Track	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84
Net Unsupported Debt	\$23.10	\$15.49	\$12.59	\$18.24	\$12.64	\$10.74	\$17.74	\$12.14	\$10.24

* Level #1 - Celtics move to new arena (no hockey); Level #2 - Celtics and NHL move to new arena; Level #3 - Boston Garden not operating.

** Note that operation of the Arena Complex at the North Station or South Station sites creates from \$300,000 to \$475,000 of parking revenue for adjacent parking facilities. Capitalized at 5.828 percent, this represents asset value of \$5.1 to \$8.2 million.

Source: Darley/Gobar Associates, Inc.

APPENDIX A

CONVENTION IMPACT OF A NEW LARGE ARENA IN BOSTON

Boston's capacity to accommodate large conventions is limited by the availability of facilities. According to the projected event day schedule, a new large arena or two-arena complex in Boston could be expected to have convention schedules of from 18-28 days per year. Delegates at these conventions would spend from \$6.3 to \$9.8 million per year on hotels, taxis, restaurants, etc. The total effect of these expenditures through successive respending cycles would add from \$15 to \$30 million per year to incomes of Boston area residents.

Depending on how one defines a convention, there are estimates of from 35,000 to as many as 300,000 meetings and conventions per year in the United States and Canada. Both large and smaller cities have become increasingly competitive in their eagerness to attract conventions. Their motivation is a combination of civic pride and hard-headed economic realism. The economics of conventions is based largely on delegate expenditures, which bring income flows to the local community.

Sources in the convention industry estimate that in 1968, New York City was host to 812 conventions and 2.7 million delegates who spent \$267,000,000 -- or almost \$100 each. In Boston in 1969, the estimated 255,915 delegates attending 211 conventions spent an estimated \$140 each, or a total of \$36 million. San Francisco's convention activity in 1968 consisted of 527,000 delegates, attending 740 conventions, spending \$116 million -- or \$220 per

delegate.¹

A recently completed survey released by The International Association of Convention Bureaus indicates that conventions in the United States and Canada are a \$1.3 billion annual business in which over 10 million delegates spend an average of \$135 each, or \$34.27 per day in convention cities. Not included in the expenditure estimates were registration fees and cost of travel to and from the meeting, etc.

In the Atlanta Convention Bureau's Convention Digest of January/February, 1969, it was estimated that the 330,000 delegates to 440 conventions in Atlanta in 1968 spent \$50 million, which in turn circulated throughout the Atlanta economy to create an estimated total impact of \$350 million.

There is some technical difference of opinion among economists as to the magnitude of the total impact resulting from the circulation of this new money, but even were the total impact to be only two-and-one-half to three times the initial expenditure, the resulting total impact is substantial. Similar studies prepared elsewhere indicate the very beneficial impact of conventions.

An unfortunate concomitant of this increasing publicity concerning the beneficial economic impact of conventions is that the rents charged to convention sponsors have decreased as cities compete for convention business. As a result, the convention income to the facility itself is usually

¹ According to articles in Sales Meetings, Various Issues, 1968-1969.

not very great. For instance, in 1965-66, a large international convention complex in a resort community had 54 days of use of its exhibit pavilion, generating a total revenue of only \$18,262. Average revenue per day from the 70,000 square feet in the exhibition pavilion was \$338.19. Operating costs per day for the exhibition facilities were \$388.57; the facility produced, obviously, a net operating loss to the complex, in addition to such costs as the interest on the debt associated with the construction of facilities, etc. For these reasons it is necessary to exercise caution in order to avoid over-constructing facilities for these uses, however, as an adjunct use to an existing facility, conventions do create significant public benefits.

APPENDIX B

ARENA USE FACTORS

There is a tendency for laymen to want to build the largest possible arena. In many cases such a decision creates much excess capacity that goes unused. Exhibits B-1 and B-2 illustrate the pattern of attendance at NBA and NHL games in 1970-71. An even lower profile is demonstrated in less popular activities in smaller markets such as is found in ABA cities (Exhibit B-3).

The expected patterns of attendance for hockey or basketball seasons with aggregate attendance of 450,000 to 650,000 are illustrated in Exhibits B-4 and B-5. More importantly, the most used seats are used for every game while the less desirable, marginal seats may be used only three or four times a year and, as a result, produce much less income. The income pattern per seat for a 450,000 attendance year in basketball is illustrated in Exhibit B-6. A similar pattern could be expected for basketball in Boston. Hockey in Boston would produce many more sellouts, and arena revenue for the 18,000-20,000th seat increment from both hockey and basketball would be on the order of \$50 per seat per year, making a larger arena more feasible in Boston than in many other large cities which do not have the fanatical support for hockey found there.

The four locations considered for this study are all in the urban core area. A facility of this type should be located near the urban center. Indeed, most such facilities are in or near the downtown (Exhibit B-7). The reasons relate to selecting a location with greatest access to the largest

number of potential spectators. Given the opportunity, most fans prefer to travel short distances to go to arena events, most of which are held at night. The relationships between distance travelled and attendance are illustrated by Exhibits B-8, 9, and 10. As shown in the curve in Exhibit B-10, the propensity to attend diminishes sharply as a function of distance from residence to the facility. A downtown location in Boston, given the highway network, provides greater market exposure than most suburban locations that could be considered. Such a location also maximizes the socioeconomic goal of creating as much evening activity in the downtown area as possible.

EXHIBIT B-1

ATTENDANCE DISTRIBUTION
NATIONAL BASKETBALL ASSOCIATION HOME GAMES, 1970-1971
REGULAR SEASON ONLY

Game Attendance Level	San Francisco																		TOTAL	PERCENT
	Atlanta	Baltimore	Boston	Buffalo	Chicago	Cincinnati	Cleveland	Detroit	Los Angeles	Milwaukee	New York	Philadelphia	Phoenix	Portland	San Diego	San Francisco	Oakland	Seattle		
19,000 - 20,000	-	-	-	-	-	-	-	-	-	-	27	-	-	-	-	-	-	-	27	6.1
18,000 - 19,000	-	-	-	-	1	-	-	-	-	-	5	-	-	-	-	-	-	-	6	0.9
17,000 - 18,000	-	-	-	-	1	-	-	-	5	-	3	-	-	-	-	-	-	-	9	1.4
16,000 - 17,000	-	-	-	-	1	-	-	-	3	-	4	-	-	-	-	-	-	-	8	1.2
15,000 - 16,000	-	-	1	-	-	-	-	-	5	-	-	3	-	-	-	-	-	-	9	1.4
14,000 - 15,000	-	-	1	-	3	-	-	-	7	-	1	1	-	-	-	-	-	-	13	2.0
12,000 - 14,000	-	2	4	-	2	1	-	-	10	-	1	3	3	-	-	-	1	9	36	5.5
10,000 - 12,000	-	1	6	4	11	-	-	10	7	30	1	6	5	4	6	1	3	8	103	15.8
8,000 - 10,000	-	4	7	4	12	2	2	6	3	6	-	6	12	3	4	3	-	8	82	12.5
6,000 - 8,000	18	10	7	6	7	2	3	5	-	-	-	10	13	12	11	2	1	5	112	17.1
4,000 - 6,000	23	12	10	7	2	7	4	11	-	-	-	4	8	12	17	6	5	4	132	20.2
2,000 - 4,000	-	8	2	13	1	18	28	7	-	-	-	5	-	7	1	13	3	1	107	16.4
0 - 2,000	-	-	-	2	-	3	3	1	-	-	-	-	-	1	-	-	-	-	10	1.5
TOTAL:	41	37	38	36	41	33	40	40	40	36	42	38	41	39	39	25	13	35	654	100.0

Source: Sporting News, Various Issues, 1970-1971.

EXHIBIT B-2

ATTENDANCE DISTRIBUTION

NATIONAL HOCKEY LEAGUE HOME GAMES, 1970-1971

REGULAR SEASON ONLY

Game Attendance Level	Boston	Buffalo	Chicago	Detroit	Los Angeles	Minnesota	Montreal	New York	Oakland	Philadelphia	Pittsburgh	St. Louis	Toronto	Vancouver	TOTAL	PERCENT
Over 20,000	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	0.2
19,000 - 20,000	-	-	23	-	-	-	-	-	-	-	-	3	1	-	27	5.2
18,000 - 19,000	-	-	13	-	-	-	4	-	-	-	-	23	-	-	40	7.7
17,000 - 18,000	-	-	-	-	-	-	12	35	-	-	1	9	-	-	57	11.0
16,000 - 17,000	-	-	1	-	1	-	16	1	-	-	-	1	32	-	52	10.0
15,000 - 16,000	-	-	-	1	1	19	5	-	-	-	-	-	-	31	57	11.0
14,000 - 15,000	38	-	-	10	3	10	-	-	-	26	-	-	1	4	92	17.6
12,000 - 14,000	-	-	-	20	3	9	-	-	2	8	9	-	1	3	55	10.6
10,000 - 12,000	-	25	-	7	3	-	-	-	3	2	9	-	1	-	50	9.6
8,000 - 10,000	-	9	-	-	12	-	-	-	3	-	12	-	-	-	36	6.9
6,000 - 8,000	-	4	-	-	13	-	-	-	6	-	4	-	-	-	27	5.2
4,000 - 6,000	-	-	-	-	1	-	-	-	12	-	2	-	-	-	15	2.9
2,000 - 4,000	-	-	-	-	-	-	-	-	11	-	-	-	-	-	11	2.1
0 - 2,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL:	38	38	38	38	37	38	37	36	37	36	37	36	36	38	520	100.0

Source: Sporting News, Various Issues, 1970-1971

EXHIBIT B-3

ATTENDANCE DISTRIBUTION AMERICAN BASKETBALL ASSOCIATION HOME GAMES, 1970-1971 REGULAR SEASON ONLY

Game Attendance Level	Carolina			Floridians			Texas				Virginia			TOTAL	PERCENT		
	Charlotte	Raleigh	Greensboro	Denver	Miami	Jacksonville	Indiana	Kentucky	Memphis	New York	Pittsburgh	Dallas	Fort Worth			Utah	Norfolk
19,000 - 20,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18,000 - 19,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17,000 - 18,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16,000 - 17,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15,000 - 16,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14,000 - 15,000	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	0.2
12,000 - 14,000	-	-	-	-	-	-	-	3	1	1	-	-	-	1	-	-	1.4
10,000 - 12,000	1	-	1	-	-	-	5	6	-	1	-	-	-	3	-	-	4.0
8,000 - 10,000	1	-	2	-	1	-	15	8	1	-	1	1	-	6	-	1	8.8
6,000 - 8,000	1	3	6	3	1	-	19	2	2	-	2	1	1	7	-	4	12.3
4,000 - 6,000	7	7	8	15	9	4	1	22	7	25	3	6	1	15	8	7	34.4
2,000 - 4,000	2	2	1	23	16	2	-	-	16	15	18	15	1	7	9	4	31.0
0 - 2,000	-	-	-	-	-	-	-	-	6	-	16	6	4	1	-	-	7.9
TOTAL:	12	12	18	41	27	6	40	42	33	42	40	29	7	40	17	16	422
																	100.0

Source: Sporting News, Various Issues, 1970-1971.

EXHIBIT B-4

EXPECTED PATTERN OF ATTENDANCE/GAME AT AN
ANNUAL ATTENDANCE LEVEL OF 450,000 FOR BASKETBALL OR HOCKEY

Game Attendance Interval	Frequency	Cumulative Times Used Per Year	Percent of Total Usage (Revenue)	Cumulative Percent
Under 4,000	1	42	36.8	36.8
4 - 6,000	2	41	18.0	54.8
6 - 8,000	7	39	17.1	71.9
8 - 10,000	11	32	14.0	85.9
10 - 12,000	14	21	9.2	95.1
12 - 14,000	4	7	3.1	98.2
14,000 +	3	3	1.8	100.0
Total	42		100.0	

Source: Darley/Gobar Associates, Inc.

EXHIBIT B-5

EXPECTED PATTERN OF ATTENDANCE/GAME
AT AN ANNUAL ATTENDANCE LEVEL OF 650,000 FOR HOCKEY

Attendance Interval	Frequency	Cumulative Times Used Per Year	Percent of Total Usage (Revenue)	Cumulative Percent
Under 12,000	0	38	70.1	70.1
12 - 14,000	2	38	11.7	81.8
14 - 15,000	2	36	5.5	87.3
15 - 16,000	12	34	5.2	92.5
16 - 17,000	7	22	3.4	95.9
17 - 18,000	7	15	2.3	98.2
18,000 +	8	8	1.8	100.0
Total	38		100.0	

Source: Darley/Gobar Associates, Inc.

EXHIBIT B-6

NET REVENUE DIFFERENTIAL PER INCREMENTAL UNIT OF SEATING CAPACITY FOR BASKETBALL

Seating	Ticket Price	Arena Revenue/ Usage at 10% Rent	Arena Revenue/ Usage From Parking & Concessions	Total Arena Revenue/Usage	Frequency of Usage Per Basketball Season	Total Arena Revenue/Seat Per Season From Basketball
1,000	\$6.25	\$.625	\$.41	\$1.035	42	\$43.47
2,000	6.00	.60	.41	1.01	42	42.42
3,000	5.75	.575	.41	.985	42	41.37
4,000	5.50	.55	.41	.96	41	39.36
5,000	5.25	.525	.41	.935	41	38.34
6,000	5.00	.50	.41	.91	39	35.49
7,000	4.75	.475	.41	.885	39	34.52
8,000	4.50	.45	.41	.86	32	27.52
9,000	4.25	.425	.41	.835	32	26.72
10,000	4.00	.40	.41	.81	21	17.01
11,000	3.75	.375	.41	.785	21	16.49
12,000	3.50	.35	.41	.76	7	5.32
13,000	3.25	.325	.41	.735	7	5.15
14,000	3.00	.30	.41	.71	3	2.13
15,000	2.75	.275	.41	.685	3	2.05
16,000	2.37	.237	.41	.647	1	.65
17,000						
18,000						

Source: Darley/Gobar Associates, Inc.

EXHIBIT B-7

DISTANCE FROM ARENA TO CENTRAL BUSINESS DISTRICT FOR VARIOUS
CITIES WHICH HAVE PROFESSIONAL BASKETBALL
OR HOCKEY FRANCHISES

City	Distance (Miles)
Baltimore	-
Buffalo	-
Detroit (Basketball)	-
Louisville (Conv. Center)	-
Pittsburgh	-
Milwaukee	0.1
Boston	0.5
Salt Lake City	0.5
Portland	1.0
Seattle	1.1
Atlanta	2.0
Chicago	2.1
Miami (Dade Co. Aud.)	2.5
Greensboro	2.6
Phoenix	2.6
Cleveland	3.0
Detroit (Hockey)	3.0
San Diego	3.0
Charlotte	3.0
Philadelphia	3.3
Denver	3.4
Dallas	3.7
Louisville (Expo. Center)	3.8
Cincinnati	4.0
Miami (Dinner Key Aud.)	4.0
St. Louis	4.0
Indianapolis	4.2
Raleigh	4.2
Memphis	5.0
Miami (Miami Beach Aud.)	5.0
San Francisco	6.0
Oakland	7.0
Minneapolis	9.5
Los Angeles	10.0
Average Distance	3.1
Median Distance	3.0

Source: Darley/Gobar Associates, Inc.

EXHIBIT B-8

DISTANCE TRAVELLED TO ATTEND INDOOR SPORTS EVENT -
OAKLAND AREA

Distance from Residence to Arena	<u>Basketball</u>		<u>Hockey</u>	
	%	Cumulative %	%	Cumulative %
Less than 5 miles	31	31	10	10
5 - 9 miles	6	37	--	10
10 - 19 miles	17	54	10	20
20 - 29 miles	31	85	28	48
30 - 39 miles	6	91	24	42
40 - 49 miles	6	97	10	82
50 miles and over	3	100	13	95

Source: Based on data from Market Potential and Fair Rental Study, Proposed Coliseum - Oakland, California, Real Estate Research Corporation, 1963.

EXHIBIT B-9

ATTENDANCE VERSUS POPULATION DISTRIBUTION IN DRIVING
INTERVALS TO ARENA - SAN DIEGO GULLS HOCKEY GAMES

Average Driving Time to Arena	Percentage of Total Attendance Coming From Area	<u>Cumulative</u>		<u>Cumulative</u>	
0 - 5 minutes	3.9%	-		5.3%	-
5 - 10 minutes	44.0	47.9		33.7	39.0
10 - 15 minutes	36.9	84.8		25.2	64.2
15 - 20 minutes	11.3	96.1		18.6	82.8
Over 20 minutes	3.9	100.0		17.2	100.0

Source: Based on a survey conducted by Darley/Gobar Associates, Inc. in San Diego, September 1967.

EXHIBIT B-10

AVERAGE DISTANCE VERSUS PROPENSITY TO ATTEND CURVE FOR INDOOR SPORTS EVENTS

